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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

OFFICIAL NOTICE—

Change of Address, Secretary New England Association of Gas Engineers. 289

EDITORIALS—

Briefly Told 289

Death of Mr. C. E. Burrows, Jr.—Notes.

Improvement of Motor Meters. 290

Proceedings, Tenth Annual Meeting of the Pacific Coast Gas Association—Official Report—Revised by the Secretary. 290

First Day, Morning Session—Roll Call—Newly Elected Members Present—Reports of Secretary and Treasurer—Report of Board of Directors—Some Additional Recommendations—Welcoming the New Members—President's Address—Committee on President's Address—*Wrinkle Department—Discussion—Considering Proposed Changes to the Constitution and By-Laws—First Day, Afternoon Session—Fuel Conditions in California, by Mr J. L. Howard—Discussion—Gas Advertising, by Mr. R. P. Valentine.

Gas Cookers: Desirable to Companies and Consumers, by Mr. W. D. Syme. 298

Regulations for Making Awards at the Louisiana Purchase Exposition 298

ITEMS OF INTEREST FROM VARIOUS LOCALITIES. 299

Changes at Marietta, O.—Chimneys Sold by Adam Weber Sons—Gas and Electric Light for Floral Park, L. I.—Manager Branch Reports Progress—Dearer Gas for Ottawa, Can.—Personal—Messrs. Lindsay and Company—Personal—Mr. J. C. Norcross Leaves Spartanburg, N. C.—Betterments at Council Bluffs, Ia.—Mr. Smith Seems to be in the Minority—Proposed Company for San Pedro, Cal.—Has American Capital Secured Control of Two Japanese Gas Plants?—Changes in Ownership. Belleville, Ills.—To Assist His Father—Death of Mr. G. N. Crandall—Proposed Gas Works for Beaver Dam, Wis.—Final Consolidation at Evanston, Ills.—Some Extracts from Inspecter Ford's Report Respecting Washington (D.C.) Gas Supply—And Other Items.

The Market for Gas Securities. 301

[OFFICIAL NOTICE.]

Change of Address, Secretary New England Association of Gas Engineers.

NEW ENGLAND ASSOCIATION OF GAS ENGINEERS,
OFFICE OF THE SECRETARY,
NEW BEDFORD, MASS., August 13th, 1902.

To the Members of the New England Association of Gas Engineers:

After the 18th inst. the office of the Secretary of the New England Association of Gas Engineers will be at 26 Central Square, East Boston, Mass.

N. W. GIFFORD, Secretary.

BRIEFLY TOLD.

DEATH OF MR. C. E. BURROWS, JR.—The Pacific Coast fraternity will sadly share with Mr. C. E. Burrows, Secretary and Superintendent of the Walla Walla (Wash.) Gas and Electric Company, and last Past President of the Pacific Coast Gas Association, his great sorrow over the untimely death of his son, Mr. C. E. Burrows, Jr., who was also in the employ of the Company. Early in August young Mr. Burrows went on his usual summer vacation, accompanied by his wife and their infant son. Part of their outing included a sailing trip on the yacht "Henrietta," owned by his friend, Mr. George U. Piper. The morning of August 9th, while sailing through Puget Sound, from Alki Point en route to Tacoma, Mr. Burrows lost his footing aboard, and before aid could reach him he was drowned. The body was subsequently recovered and removed to his former home in Walla Walla, where interment was made under the auspices and direction of the order of Elks, of which organization deceased had been a prominent member. Deceased was born in Salem, Ore., in 1872, and was elected a member of the Pacific Gas Association on the occasion of its ninth annual meeting, July, 1901. He was a man of much promise in his chosen profession.

NOTES.—

IF several more of the members of the Western Gas Association were imbued with the spirit and practice which animate and move the mind and ways of ex-President J. B. Howard, of Galena, Ills., the shelves of the Thompson Memorial Library would acquire many additions. Following his many other contributions to the Library, "Uncle Jerry" has sent in a rare book for the present days—an original Second Volume of "Ure's Dictionary."

AT the annual meeting of the United Association of Plumbers and Gas Fitters, which was held in Omaha, Neb., some days ago, the officers chosen were: President, William M. Merrick, of Beverly, Mass.; Treasurer and Secretary, L. W. Tilden, of Chicago. The convention for next year will be held in Birmingham, Ala.

MR. HENRY BEIHN has resigned the position of Cashier to the Racine (Wis.) Gas Light Company, to accept a responsible place with a prominent Milwaukee manufacturing concern.

THE California Central Gas and Electric Company has declared the usual monthly dividend of 1½ cents per share, payable the 10th inst.

THE proprietors of the Willimantic (Conn.) Gas and Electric Company have arranged for extensive plant additions and betterments to the electric division of their enterprise.

Improvement of Motor Meters.

An American patent that will attract much attention in the electrical world is one recently granted to Prof. Elihu Thomson, on an application filed in January, 1900, his object being to simplify and cheapen the construction, and render the operation of the meter uniform over all ranges of load. It is especially applicable to meters operating under direct current. A register is provided, driven by a meter motor at a speed varying with the load on the consumer's circuit, in which the meter is installed in a manner usual with electric meters, and a motor comprising an armature or torque producing element formed of a plurality or flat or "pancake" coils moving in a magnetic field of constant strength. The field for the sake of cheapness and convenience is excited by one or more permanent magnets, between the poles of which the pancake coils are mounted for rotation. As many such coils as desired may be employed and symmetrically disposed about the axis of rotation and supported in a common plane, to which the load current of the consumer's translating devices is led through a suitable commutator, formed of three segments, and a corresponding number or multiple thereof of armature coils. The small number of segments also permits the commutator to be made of small diameter, thus rendering brush friction low. A type of commutator suitable for the purpose is that employed in the Thomson-Houston 3-coil arc lighter. In shunt to the armature is a resistance of such value as to take the maximum portion of the current flowing through the meter.

With an organization of the kind just outlined, the effect of the friction of the moving parts is such that it is impossible to so adjust the meter that it will register the energy consumed with substantial accuracy both at low and at high loads. If the meter is so adjusted that its registration is accurate at the normal load for which the meter is constructed, there will be a considerable inaccuracy in the registration at very low loads, due to the fact that the friction of the moving parts, which is substantially constant at all speeds, becomes a greater proportional part of the load as the load on the meter decreases. The load due to the friction of the moving parts is, however, small in comparison with the load on the meter when full load current is flowing in its actuating windings. It is, therefore, possible to materially increase the accuracy of registration at low loads without decreasing by so great an amount the accuracy at full load by so adjusting the meter that its registration will be correct at some point intermediate between zero and full load, the particular point being determined in accordance with the range of load to which the meter is likely to be subjected. The meter when thus adjusted will, of course, register too low at low loads and too high at full loads; but its accuracy will on the whole have been substantially increased. It is not, however, possible by such an adjustment to make the registration accurate at all loads up to the full load limit for which the meter has been designed.

Prof. Thomson states that it is possible to so modify the organization above specified that the registration of the meter may be made substantially accurate both at light loads and up to the maximum load for which the meter is designed, and one of the features is a corrective which will obviate the inaccuracies above referred to and will render the registration of the meter truly proportionate to the load on the circuit. A retarding-magnet system comprises, in addition to the damper which slows down the speed of the meter motor at all times, an auxiliary damper, consisting of an electro-magnet carrying a current varying with the load in the consumer-circuit, and provided with an iron core so proportioned that its magnetization will be raised to or near the point of saturation as the meter load approaches a maximum. The magnetization of this auxiliary damper is, of course, nil at zero load; but as the load comes on its damping tendency rapidly increases until when the load approaches a certain value, where the core of the electro-magnet approaches saturation, the curve representing the retardation due to the auxiliary damper becomes flattened, and the effect of the said damper is thereafter substantially the same as that of a permanent magnet. With such a construction the meter is so adjusted that it registers with substantial accuracy at full load when the core of the auxiliary damper is saturated. As the load falls off, that part of the retardation which is due to the auxiliary damper falls off at first slowly, and later at an increasing rate as the magnetization falls below the bend in the "curve of magnetization," until finally when the load reaches its minimum value it becomes practically nil. By properly designating the electro magnet constituting the auxiliary damper its effect may be made to exactly compensate for the frictional resistance of the moving parts of the meter, so that the curve of registration will be substantially a straight line up to the maximum load for which the meter is designed, it being understood that beyond this load the curve of registration is likely to fall-off somewhat, probably by reason of the disproportionate counterbalancing effect of the counter electro-motive force generated in the meter-armature at such loads.

[Official Report—Revised by the Secretary.]

PROCEEDINGS, TENTH ANNUAL MEETING OF THE PACIFIC COAST GAS ASSOCIATION.

Held in the Rooms of the Pacific Gas Improvement Company, San Francisco, Cal., July 15th and 16th, 1902.

First Day, July 15th.—Morning Session.

The tenth annual meeting of the Pacific Coast Gas Association was called to order by the President, Mr. C. E. Burrows, at 10 A.M., July 15th.

ROLL CALL.

The Secretary called the roll, the following members responding to their names:

Adams, H. E.	Eichbaum, C. W.	Keyes, H. C.
Aldrich, W. A.	Froelich, C.	Lowe, L. P.
Alstrom, O. F.	Foveaux, F.	Lowe, S. C.
Arques, C. L.	Gillespie, W. W.	Lloyd, A. J.
Beck, A. C.	Grant, E. P.	Martin, J.
Britton, J. A.	Greer, R. P.	Malloch, H.
Boardman, W. F.	Grimwood, J. B.	Osborn, M. C.
Brouse, E. H.	Guthrie, S.	Petersen, B. S.
Burrows, C. E.	Gutsch, A.	Petch, T. D.
Baurhyte, W.	Holberton, G. C.	Poole, C. O.
Clark, O. E.	Hollidge, G. H.	Papst, H. M.
Clarke, R. L.	Hughes, C.	Quilty, C. W.
Colquhoun, G. S.	Howard, J. L.	Randall, E. C.
Converse, C. M.	Jones, E. C.	Thomas, J. W.
Cressey, F. A.	Jones, F. C.	Thompson, G.
Decker, D.	Kaneen, J. F.	Valentine, R. P.
Druffel, D. O.	Keaton, G.	Wilson, G. W.
Eichbaum, F. H.	Kirk, G.	Wiester, W. H.

Newly-Elected Members Present.

Blanckenburg, Theo., 23 Stevenson street, San Francisco, Cal.
Burdell, J. B., Mgr. Petaluma G. and E. Co., Petaluma, Cal.
Dole, W. S., Supt. Indep. Gas & Power Co., San Francisco.
Ellis, Geo. B., Pres. Redlands Gas Co., Redlands, Cal.
Grimwood, C. P., Engineer, 214 Pine street, San Francisco.
Hunt, A. M., Gen. Mgr. Indep. Gas & Power Co., San Francisco.
Jordan, W. F., Mgr. Riverside Lt. & Fuel Co., Riverside, Cal.
Kabus, W. M., Portland Gas Co., Portland, Ore.
Low, Geo. P., Ed. Journ. Electricity, Gas and Power, San Francisco.
Mills, Jno. B., 113 Davis street, San Francisco.
Newbert, S. H., Mgr. Marysville G. & E. Co., Marysville, Cal.
Pennoyer, C. H., Secy. & Gen. Mgr. United Gas & Elect. Co., San Francisco.

The President—It has been suggested that right after roll call we take up that portion of the Directors' Report which alludes to the admission of new members, so that the latter may come in immediately or without waiting until the regular order. If there is no objection that action will be taken. The Secretary will read his report.

Reports of Secretary and Treasurer.

Secretary and Treasurer, J. B. Grimwood, here read his annual reports, which were, on motion of Mr. W. Aldrich, received and adopted.

Rerort of Board of Directors.

The President ordered read the report from the Board of Directors, which was duly done.

Some Additional Recommendations.

The Secretary—At a meeting of the Board of Directors of the Pacific Coast Gas Association, held in San Francisco, July 14th, the following recommendations to the members were made:

First: That the By-Laws be amended to provide for an associate membership, to consist of corporations engaged in the manufacture or sale of gas, which corporations shall have the privilege of sending one representative to each meeting of the Association, said representative to be entitled to all the privileges of active membership, excepting the casting of a vote or the holding of office. Dues per annum to be $5 for membership, payable in advance, each company to be limited to four representatives.

Second: That the offer of Messrs. Lowe and Martin to tender a banquet and an outing to the Association be accepted.

On motion of Mr. Britton that portion of the report of the Board of Directors referring to the admission of new members and the papers submitted was approved, with the understanding that the other sections be taken up later in the session for action.

On motion of Mr. Britton the offer of Messrs. Lowe and Martin to

provide at their expense a banquet and outing for this year's session was accepted by rising vote.

Mr. L. P. Lowe—I think the Secretary overlooked one of the matters taken up last night; that in reference to the matter of doing away with an official organ.

The Secretary—I understand the official action on that matter was, that the Directors would not make such recommendation. If an individual member of the Association wished to do so, he was at liberty to make it in open session this morning.

Mr. Lowe—I don't so understand it. I think it was voted upon by the Directors last night, and they decided to recommend it as well.

The Secretary—But that action was rescinded this morning.

Mr. Lowe—I beg your pardon.

Mr. Aldrich—They had time to sleep on it, Brother Lowe.

Welcoming the New Members.

To introduce the new members that were elected, the President appointed as a Committee, Vice-President Osborn, Mr. W. A. Aldrich and Mr. L. P. Lowe.

Mr. Osborn, as Chairman of the Committee, then introduced the newly-elected members to the Association, amidst the applause of the assembly.

The President—In behalf of the Association, I take pleasure in welcoming the new members, and ask them to take an active part in our proceedings, with the older ones.

PRESIDENT'S ADDRESS.

Vice-President Osborn then took the chair, and the President read his annual address.

[For the text of the President's address, see Journal, Aug. 25, p. 254.]

Committee on President's Address.

The Chairman—Gentlemen, you have heard read the interesting address of our President. Are there any remarks? If none, the usual committee will be appointed, to be composed as follows: Mr. John A. Britton, Oakland; Mr. W. A. Aldrich, Spokane; and Mr. G. W. Wilson, of Vallejo.

WRINKLE DEPARTMENT.

President Burrows resumed the chair and called upon Mr. George S. Colquhoun, of Fresno, Editor of the Wrinkle Department, to present his budget of Wrinkles for the year, which Editor Colquhoun did as follows:

Mr. President, and Members of the Pacific Coast Gas Association: The "Wrinkle Department" for this year has not been patronized as it should have been, owing, I presume, to the great activity in the gas business on this Coast for the year, and consequently some of the members have been too busy to spare the time from their regular duties, to give this matter a little thought.

I have not had the pleasure of visiting any of the other plants to gather for myself the many devices or "Wrinkles" that are to be seen in everyday use, and which would be of great value to some others of our members, who have to overcome like conditions. The members should bear in mind that it is almost impossible for the Editor alone to make a success of this department. He must have the help of the members. I wish to thank those who have contributed, and hope the members will contribute more liberally to this department next year.

No. 1.—*A jack, or trip-jack with bit, for running pipe under lawns or street crossings.*—By Mr. T. R. Parker, Napa, Cal.—I find the following is very effective in introducing services under cement sidewalks, lawns and street crossings.

It is known as a jack, or trip-jack, sometimes called the Barrett jack, made by a manufacturing company at Pittsburg, Pa.

The pressure exerted by one man is 10 tons, and the movement is ¼ inch at each movement of the lever, or 1 inch with full stroke forward and back.

We have forced a 2-inch pipe for 90 feet, as straight as a line. We use no paint, as it tends to deflect the pipe, if meeting with a stone, root or other hard or slippery substance. The opened end of a coupling, with the forward end sharpened from the inside, cuts its way and only fills the pipe a foot or so with dirt. We use a piece of 2½ inch, about 18 inches long, on the pilot end with the sharpened coupling, which is detached, leaving pipe in position.

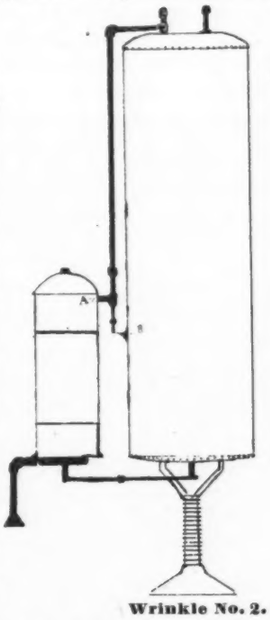
In case of ¾ or 1 inch take off the 2½ inch end, pull out the 2-inch and pass the smaller pipe through the holes. As yet we have not forced anything larger than 3-inch cast iron under street crossings. We lay the jack into a trough made for it in the trench, put the capped end of the pipe against the jack, pointed to the grade and direction you wish it to go, working your lever, which will force the pipe into the earth 13½ inches, shove the rack back by lifting the pawls, drop in a piece of that length and proceed as before.

We use the first piece, which is 10 feet, including the 18-inch piece of 2½-inch, and 8 other pieces, each 13 inches longer than its fellow, which laid out in line gives us 50 feet.

The pieces are capped with a hole drilled in one end, and a piece of ⅜-inch pipe projecting ¼ inch in the other cap to act as a dowel.

No. 2.—*To connect water heaters with boilers.*—By Mr. Geo. D. Roper.—Set the heater in the usual way, take cold water connections from bottom of boiler to bottom of heater, hot water from top of heater to top of boiler, as per drawing, then connect from top of heater, or at "*A*," to side opening of boiler at "*B*," with ¾-inch pipe. This will relieve pressure in case of being air bound or trapped.

No. 3.—*Fire basket for heating lead for laying mains.*—The device is made from a piece of 20-inch steel pipe, or sheet iron, rolled and riveted, 24 inches long. There are no legs; it rests solidly on the ground. The grate is 6 inches from bottom. Air is admitted for combustion by digging out a little earth at bottom, replacing same just before lead melts, which will then keep the lead at an even temperature for hours, with very little waste or annoyance. The arrangement for lifting pot off is simple, as is the method of passing two rods through two iron loops for carrying the whole thing.



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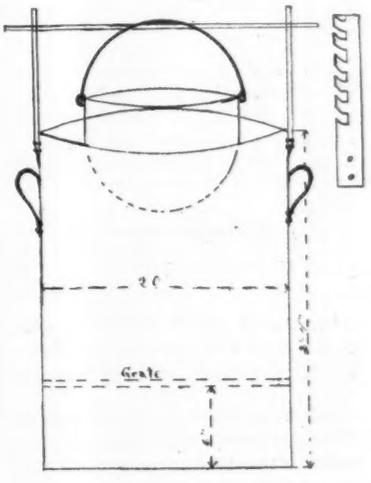
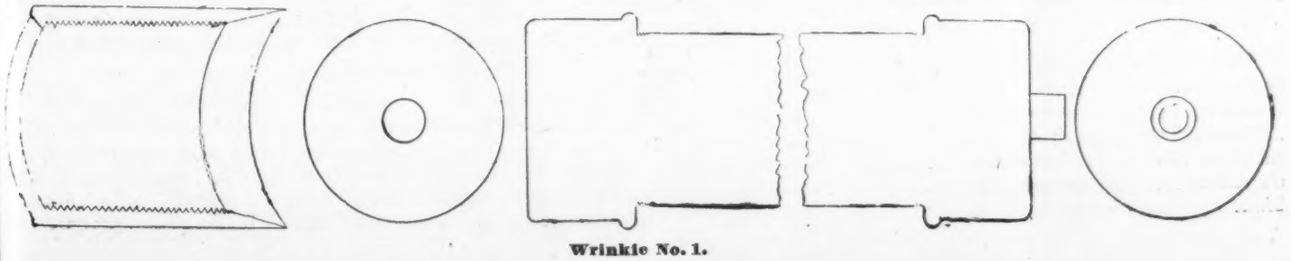
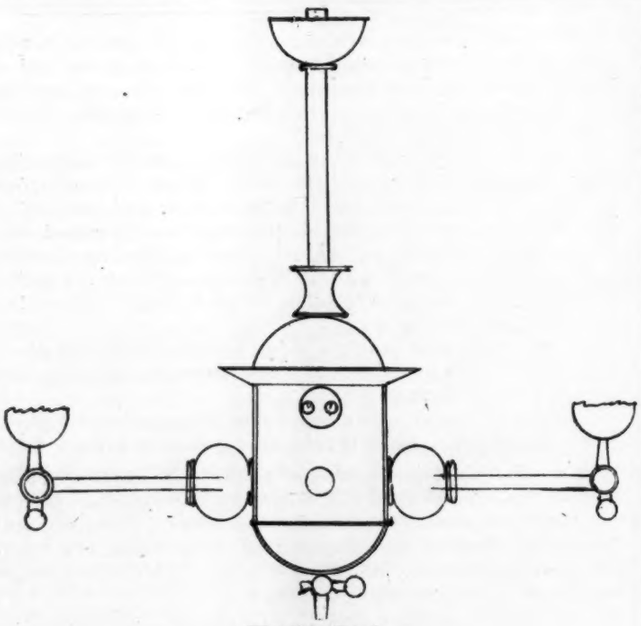


Wrinkle No. 3.

No. 4.—*Thomas' combination meter, reflector and pendant.*—The meter is a circular, dry 3-diaphragm, covered on the outside with fluted copper, or tin nickle-plated, which acts as a good reflector and keeps the meter cool, by a current of air continually passing up between outer case and meter. As the design is shown on sketch, it can be constructed circular or otherwise; the sketch shows round meter. The gas



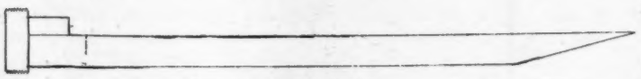
Wrinkle No. 1.



Wrinkle No. 4.

enters in the center of the top, which can be readily attached to the drop in the center of any room. There can be two, three or four outlets on sides to receive pendant arms, as shown. Also tap at bottom for use of table lamp, gas boiler or small heater. It can be made prepay, if required; also it can be supplied without reflector, pendant, arms or down pipe.

No. 5.—*A cone or spud in pipe of meters.*—By Mr. John Hearne, New York.—The spud or brass connection which is soldered into the pipe on the side of meters is to be lengthened about ¼ inch, and a shoulder is cut in about ¼ of an inch, so that it will go below the crown or top of meter, to prevent the twisting off of pipes.



Wrinkle No. 5.

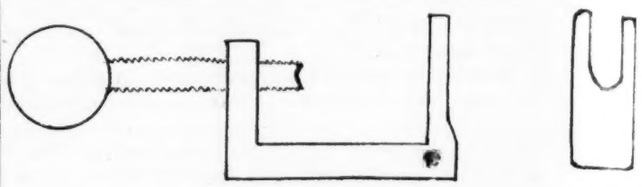
The cost of extra brass would amount virtually to nothing, and the device saves a vast amount of annoyance. This would also be strong enough for iron connections, where such are used.

No. 6.—*A check cap for testing and proving meters.*—By Mr. John Hearne, of New York.—This is simply a cap made out of a part of a meter coupling having a small piece of tin soldered on top, with a round hole punched in about ⅛ inch in diameter, which is used by meter repair men in testing meters.

Wrinkle No. 6.

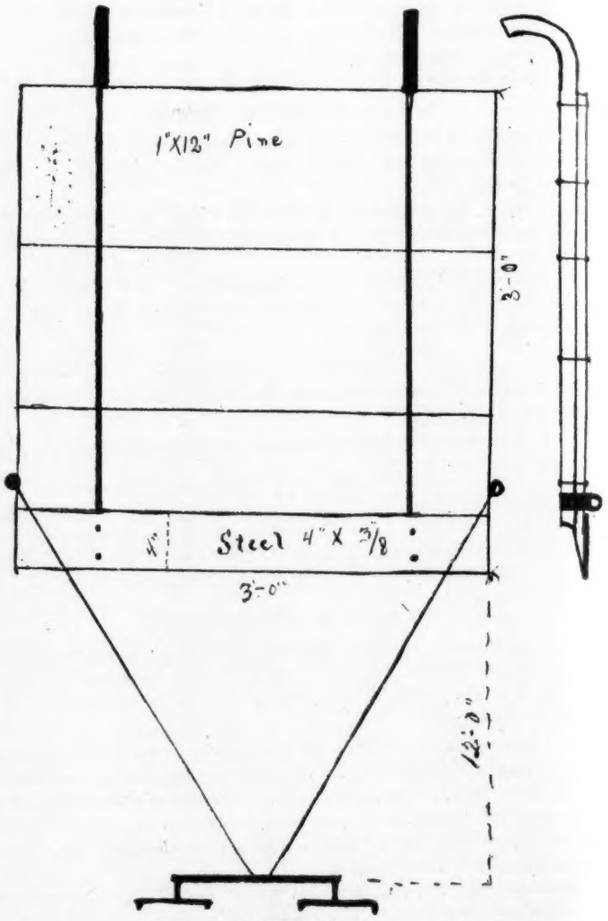
The noise or whistling which often accompanies this kind of work is sometimes very annoying, and is stopped by cutting a small nick with a chisel in the orifice or hole in top of cap.

No. 7.—*A clamp for taking off or raising the worms on the cranks of gas meters.*—By Mr. John Hearne, of New York. The fork end of this clamp is placed under the worm. The top end with thumb screw is placed on top of king post. The thumb screw is then turned, when the worm will come off without the use of soldering iron, which is not only slow, but often destroys the worms when they are not made of brass.



Wrinkle No. 7.

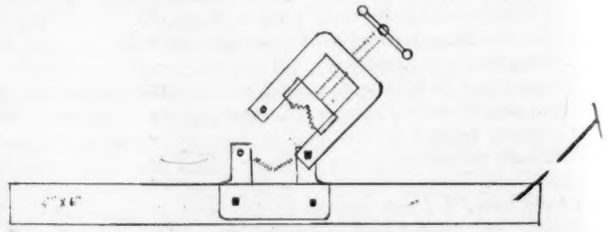
No. 8.—*A scraper for filling in pipe trenches.*—A scraper made as



Wrinkle No. 8.

shown in the cut, with two men and a team, can fill an ordinary pipe trench at the rate of 400 feet per hour.

No. 9.—*A portable pipe vise for use in laying mains.*—The vise is bolted to a piece 4 by 6 inches, and 6 feet long, with rope fastened to one end for moving same. This vise will hold length of pipe firmly for



Wrinkle No. 9.

taking off couplings and changing or setting up tees or crosses, and saves much time bothering with tongs. One man with it can do as much work as two can without it.

No. 10.—*An electric connection for indicating quantity of gas in holder at a long distance, by use of telephone wires.*—By Mr. Allen H. Babcock, San Francisco.—The State Prison at San Quentin, California, is supplied with gas pumped from the San Rafael works of the California Central Gas and Electric Company through a 2-inch main about 3 miles long, into a gasholder located in the prison grounds. Until

within the past few months the gas maker at San Rafael had no means of knowing the height of the prison gasholder, except by telephoning to one of the guards at the prison gate. A man had then to be sent out to investigate and report. The inconvenience of this procedure soon led to a system of guessing, more or less accurate, depending upon the guesser. Finally the gas maker came to run his pump about so many hours every day, and the prison had gas or not, according to the accuracy of his estimate of the quantity consumed. The prison guards could be depended on to make their wants known when the holder was flat, and sometimes they telephoned when it was blowing at the seal; but there was a considerable, steady loss of gas, and the general operation of the system was very unsatisfactory to both parties.

Early in this year a 600-horse power motor installation was made in the prison to drive the jute mill, and, for the convenience of the station men, a telephone loop was strung on the Company's poles between the San Rafael sub-station and the prison transformer house. The presence of this telephone line was a constant temptation to the writer to devise an electric indicator which would show in San Rafael, at all times, the height of the holder at the prison. Accordingly, when Mr. E. C. Jones assumed control of the gas plants of the Company, the offer was made and received cordial and instant acceptance.

If the telephone line was to be used, both wires of the loop must be treated exactly alike, or the induction effects from the power line would render it unfit for telephone purposes. The telephones are connected in multiples; therefore, the indicator must be in multiple. The necessities of the case demanded that the indicator circuit be of comparatively low resistance, while its impedance must be high or the telephones would be short circuited and put out of commission. By means of choke coils with a closed magnetic circuit it is possible to arrange a path that is practically no obstacle to the minute direct currents given by a primary battery, but is an impassable barrier to the very high frequency alternating currents produced in a telephone by the human voice.

Two such coils were wound and placed in multiple with the telephone loop; one at the San Rafael gas house, the other at the prison meter house. Each coil is wound in two equal parts, at the junction of which a tap is taken out. It is evident that these taps occupy symmetrical positions with reference to the telephone system, and that for our indicator purposes they form the ends of a single conductor, while the telephone system is in no way disturbed for telephone purposes, even though both taps be grounded.

At the San Rafael end the middle tap was led through a 3-volt scale, Weston direct-current voltmeter, from which all the resistance had been removed, leaving only the movement; thence through a battery of 5 Daniells' porous cup cells, to ground. At the prison end, the middle tap was led to a rheostat contact that is moved over contact plates by the motion of the holder. The holder rises 10 feet, and by suitable pulleys this motion is reduced to about 2½ feet at the sliding contact. The other end of the rheostat is led to ground. When all was connected the rheostat contact was moved so as to cut out all the resistance. The voltmeter at San Rafael was then adjusted to give full scale deflection. When the contact was moved to cut in all the resistance, the voltmeter read about ¼ volt; hence ⅝ of the scale is available, which is plenty for all practical purposes. The whole scale cannot be made available for the reason that the line and coils have an appreciable resistance, even when the rheostat is entirely cut out.

The benefit this indicator is to the Company will be apparent to every gas man. The prison now always has a supply of gas, and Mr. Osborn, the Manager at San Rafael, informs me that the gas maker now runs the pump only about half as much as formerly, and yet the consumption of gas at the prison is up to its usual mark.

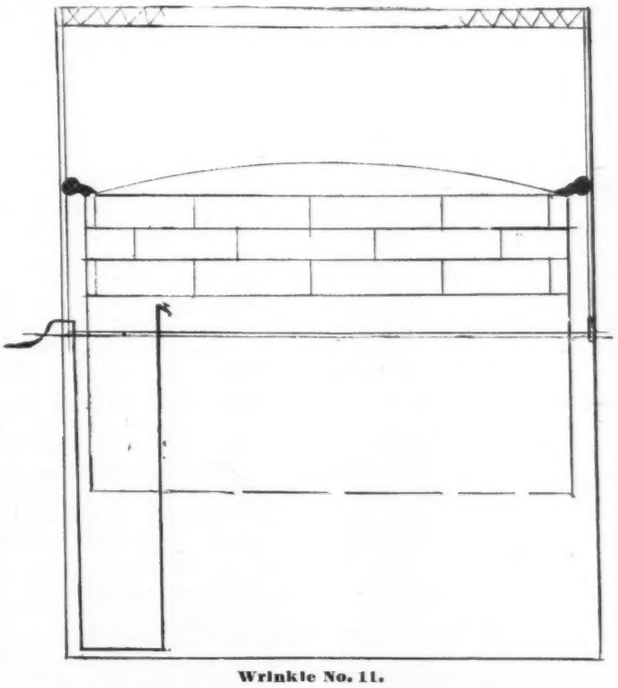
The total cost of material and labor used not including the telephone line does not exceed $60.

The line consists of two, No. 9 E. B. B., iron wires, 3.1 miles long in muliple; the resistance of each wire is 47.4 ohms. Two half coils are in series with each wire, and the resistance of each half coil is 75 ohms. The joint resistance of the two paths in multiple is 98.7 ohms. The resistance of the instrument movement is approximately 150 ohms. The total fixed resistance, therefore, is 248.7 ohms.

The rheostat consists of 1,000 feet of No. 21 Climax wire wound into 40 coils, therefore, its total resistance is about 600 ohms.

The choke coils were designed and made by Mr. Armstrong of the Telephone Company, to whom I am indebted for this part of the outfit.

No. 11.—*A means of keeping water cool for the men at the gas works in use at Santa Rosa, Cal.*—This is accomplished by running pipe down to bottom of holder, as per drawing.



Wrinkle No. 11.

No. 12.—*With the adjustment of seal level and hydraulic main.*—By Mr. C. R. Collins, of Seattle, Wash.—A large section of hydraulic main in connection with a stack of benches of fives had settled at one end, so that there was a difference in the level of 1¼ inch. In order to correct this, and to readjust the levels without stopping the operation of the benches, galvanized iron sleeves, each made in two sections with slip joints, were inserted through the straddle pipes into each pipe and the length adjusted by means of the slip joint, so as to make a uniform depth of seal at each dip pipe.

If this plan had not been resorted to it would have been necessary to let down the entire stack until the hydraulic main had been re-leveled.

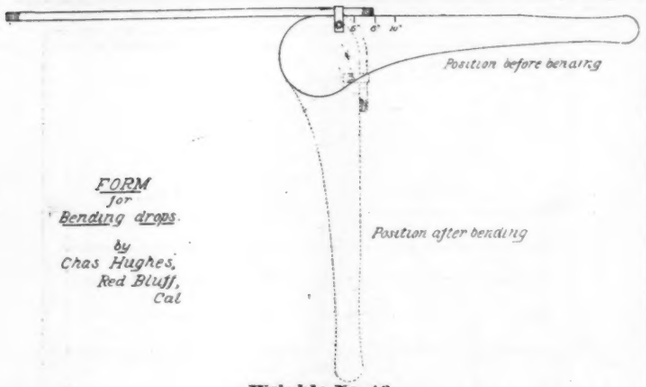
No. 13.—*An adjustable valve for the regulation of the gas supply to burners.*—The feature consists of a separate needle valve with which the gas orifice may be enlarged or reduced in order to mix the proper quantity of gas and air for perfect combustion. When the gas range has been set in a locality where there is a high pressure of gas, to reduce this pressure heretofore a governor has generally been placed at the meter to cut down the supply of gas. This has been found unsatisfactory, as by the use of the governor the velocity of the gas is cut down, making poor combustion at the burner. By this appliance, when the gas stove is set in place, each burner is adjusted according to the pressure of gas, so that no matter whether the pressure is increased or diminished the burners operate satisfactorily and no waste of gas is experienced. Another advantage of this adjustable valve is that a servant can turn the valve wide open and not increase the consumption of gas.

We believe this idea was originated by one of the former members of the San Francisco Gas Company, and it has been used by them in all high pressure districts very successfully for a number of years.

No. 14.—*The way to connect large gas ranges.*—The hotel and other large ranges, having 6 burners or more on top, wherever the pressure of gas is not sufficient to have all of the burners running in full force, by making a double connection from the service pipe (that is, by connecting the range with the service pipe at each end, instead of at one end, as is usually done with regular gas rangers) it has been found that the efficiency of all the burners is largely increased. All gas ranges of large sizes are so constructed as to allow this double connection, whenever it is found necessary.

No. 15.—*The kind of oven burners to use when the pressure is very low.*—When the oven burners of a gas range go out after being lighted, from lack of a good supply of gas, by using drilled burners instead of sawed, this difficulty is overcome in a great many cases.

No. 16.—*Form for bending pipe.*—By Mr. Chas. Hughes, Red Bluff, Cal.—Put a short piece of pipe in vise a little larger than the piece of pipe to be bent, then slip piece through same, and bend with the form.



Wrinkle No. 16.

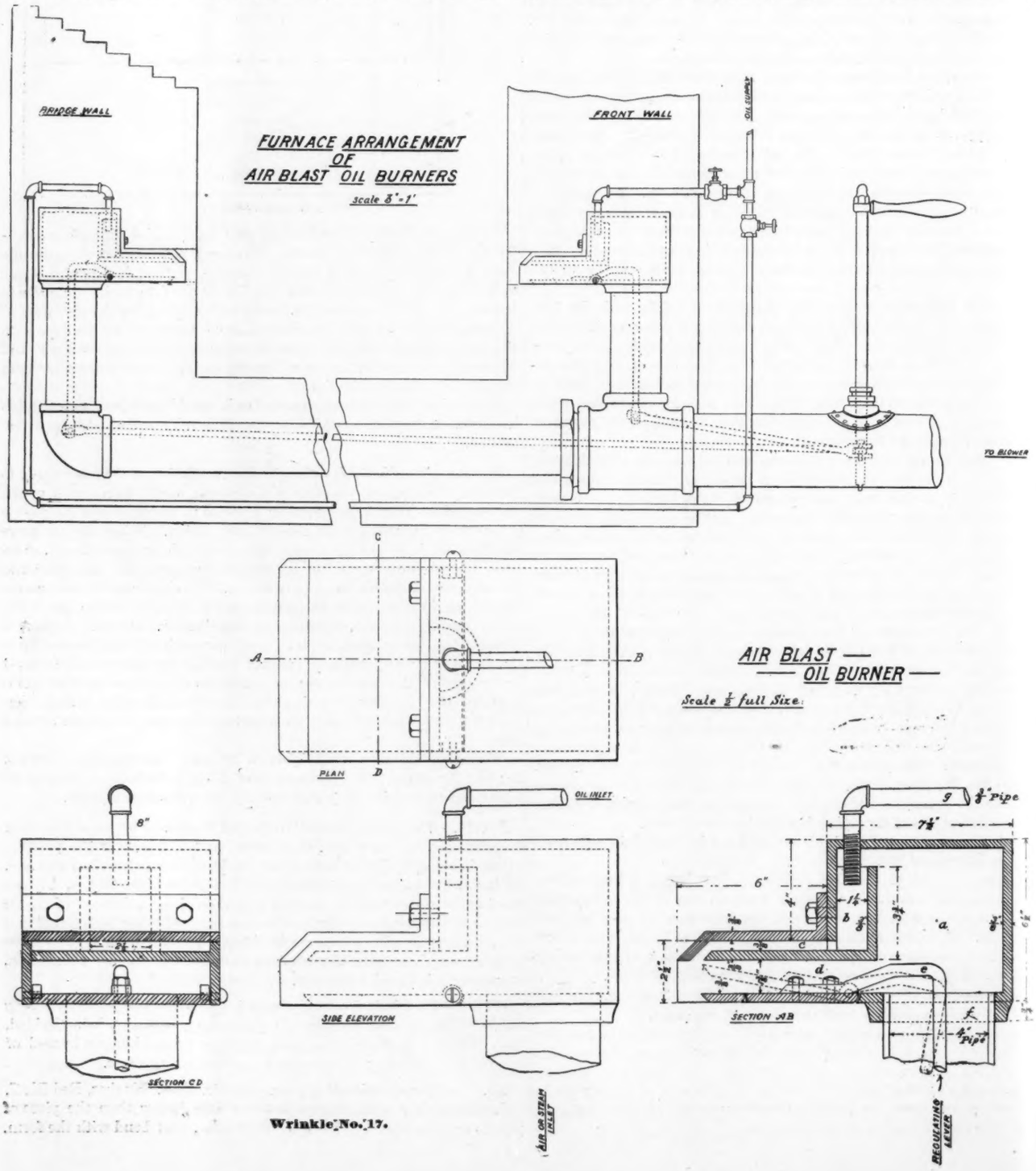
No. 17.—*Low pressure air blasts for burning crude oil under burners and generators.*—By Mr. R. L. Clarke, San Diego, Cal.—Experiments have been lately made at the works of the San Diego Gas and Electric Light Company, with a system of low pressure air blasts for burning crude oil under boilers and generators.

The accompanying prints will be understood, when it is explained that the air blasts enter at opposite sides of the furnace and meet in the center, there completing the atomizing and combustion of the oil.

We are now experimenting with this style of air blast, oil burners on a Springer setting, introducing the air and oil without steam above the fire, but using it only to assist in heating the generator, which enables us to use our surplus coke and obtain as good results as from coal.

The use of *compressed* air has been tried by a great many in past years with some success but little economy, and those who have used it will fail to see how the pressure of an ordinary cupola blower will atomize crude oil sufficiently for good combustion.

Therein lies the secret of the success of this invention, which has been recently patented. It is in the opposing of two or more such low pressure air blasts laden with partially atomized oil that the final breaking



Wrinkle No. 17.

up and combustion occur where the blasts meet, and with wonderful results.

Discussion.

Mr. Britton—I think No. 5 is one of the best Wrinkles ever submitted to the Association. I presume all of you in the business are troubled the same as we are, in obtaining the proper registration of supplementary meters. Owners of lodging houses want small meters for heating stoves, or want to separate their light bills from the balance of the house, and I believe the sale of gas could be very much promoted if that thing is feasible and can be made and put upon the market for a small price. Especially with gas stoves and heaters, large sales could be promoted, in lodging houses and small stores. It would do away with gasoline stoves. I think that is a matter that deserves our attention. I would like also to speak upon Wrinkle No. 2. I think that could be very much improved by bringing the water pipe down through the chimney that carries off the products of combustion from the heater. The cold water is then superheated to a limited extent, but to an extent sufficient to promote a better value than without. The waste gases naturally heat the water, especially if a copper pipe and not a wrought iron pipe is put in there, and it adds very much to the efficiency of the heater.

Mr. Osborn—I think that that fixture or meter would be a very good thing, if the price is not too high, particularly during the heated season. Our dwellings are not generally piped for heating, and it would be a very good thing if we had a supplementary heater, so that people who do not use heaters could secure the benefit of such if they had a way of measuring it out to them.

Mr. Aldrich—Two meters are not necessary. We need but one meter. A duplication of meters is not required.

Mr. E. C. Jones—I would like to say something about Wrinkle No. 8. Mr. Colquhoun's modesty has caused him not to say that he was the author of it. I happened to be in Fresno the other day, and saw that particular scraper working. I was very much surprised at the rapidity and the good quality of work that was done by the scraper. It was filling in some trenches very rapidly. It has an advantage over "V" scrapers that run parallel to the ditch, in that there is no danger of the team getting into the ditch with pipe; no danger of the horses' feet getting in and hurting them.

The President—Regarding the last Wrinkle would Mr. Clarke like to make any explanation about it?

Mr. R. L. Clarke—I don't know that I can say anything more about the working of the apparatus, save that which was read. It has two low pressure air blasts, directly opposite each other. Perhaps I can point it out on the diagram. This is a blast pipe under a boiler, coming in under a furnace. This represents the bridgewall, and that is the front wall of the boiler. The air coming from an ordinary fan, or a Roots' blower, comes in here and passes up that pipe to a front burner. The opening in these burners is very large, both for the oil and the air. The air comes out through here. It divides, part going to the back burner. The two air blasts meet in the center with the oil in suspension. The oil comes down through this pipe to the back burner, to that pipe in the front burner, and the combustion in the center of the furnace where the air and oil meet is a very intense, white heat. These details will show you the construction of the burner. It is an invention of Mr. Trapp, of Seattle, I believe. We let him try his invention under our boilers for the first time, and I have since put it under the Springer, using the oil over the fire to help the heating of the generator, and it does very well. I will be pleased to answer any questions.

Mr. Osborn—Does it save oil and coke?

Mr. Clarke—Yes, sir. You can run on coke about the same as you could on coal, by using the oil above the fire for heating the checkerwork.

Mr. E. C. Jones—I would like to ask Mr. Clarke whether he has made any test as to the relative efficiency of this device over an ordinary one.

Mr. Clarke—Yes, sir; we have under the boiler. I have not experimented very much with it on the gas generator, but under boilers. We will say, according to the way the man handles it, that there is from 5 to 10 per cent. increased efficiency. While it is doubtful at times that you are saving all of that, I think fully another 10 per cent. is saved in the life of the boiler. The fire does not touch the boiler. It is low down in the ash pit, and there is no flame against the boiler at all. Less flame strikes the back head, and in every way the boiler is in better shape.

Mr. Jones—The combustion is maintained in a very limited area; in other words, a globule of fire.

Mr. Clarke—Yes, sir. It is like a big star, a bunch of fire, very bright. It runs up the side walls, but not high enough up to hit the boiler.

Mr. Osborn—Mr. President, I think we have forgotten one thing. Having acted as Editor of the Wrinkle Department for a year, I know something about what the work connected therewith is. I move that a vote of thanks be extended to Mr. Colquhoun, Editor of the Wrinkle Department. [The motion was seconded and carried.]

CONSIDERING PROPOSED CHANGES TO THE CONSTITUTION AND BY-LAWS.

Mr. Britton—I would like to read a resolution relating to the recommendation of the Directors in the matter of the amendments to the Constitution and By-Laws. I will submit it so that the members can consider it, when it may come up for action this afternoon or to-morrow morning, or so it will not be sprung upon them for action at once. I find it necessary to amend both the Constitution and the By-Laws to carry out the intent of the Directors, because the former provides for the class of membership, and the latter for the fees of members. Now our Constitution cannot be amended except by the presentation of an amendment at a regular annual meeting, at which it must be read twice and then laid over for one year; but the By-Laws can be amended at any annual meeting, by a majority of the votes of those present. Therefore, the object can be accomplished by the amendment at this annual election of the By-Laws, providing for the amount of annual dues and providing for the proposition of associate membership, and steps can be taken to procure those associate members, and the payment of the dues, as provided this year, and at the next meeting the Constitution, providing for the class of associate membership, can be amended by the adoption of this resolution I have prepared. So that the one step of getting the dues fixed for associate members can immediately go into action, while the class, which is of no importance whatever, can wait for the law which provides it shall lay over for one year. The resolutions that I propose are as follows:

Resolved, That Article III. of the Constitution be amended by inserting after clause one, the following:

Corporations, companies, firms, or individuals engaged in the business of manufacture or sale of gas, shall be eligible as associate members of the Association, and as such entitled to all the privileges of active membership, excepting that of voting or holding office.

Resolved, That Article V., Section 1, of the By-Laws be amended to read as follows:

Section . The fees for active membership shall be $5, and the yearly dues shall be $5, payable annually thereafter. For associate membership there shall be no fee, and the dues shall be $5 per annum for each membership taken by each associate member, or representative. The number of representatives allowed to each associate member, shall be limited to four.

I submit those amendments for future action of the Association.

An adjournment was then taken until 2 o'clock P.M.

FIRST DAY.—AFTERNOON SESSION.

The meeting having been called to order pursuant to adjournment, the President introduced Mr. John L. Howard, of San Francisco, who read his paper on

FUEL CONDITIONS IN CALIFORNIA.

[For the text of Mr. Howard's paper, see JOURNAL, Aug. 25th, p. 256.]

Discussion.

The President—Mr. Howard's paper is before you for discussion. Mr. Britton, have you something to say upon the subject?

Mr. Britton—Like all the former papers of Mr. Howard, he seems to have propounded the queries and answered them himself so as to leave nothing for anyone else to say. I think this is the seventh in the number of educational series on "Coal and Fuel" that Mr. Howard has favored us with, and they are all books of value. I hope some day to see his papers collated in book form and published, because they afford a history of coal from its very inception by nature to its use by the consumers, and the conditions particularly upon the Pacific Coast, that no other series of papers I have ever read from any other one man or series of men can compare with. I think we are more than indebted to Mr. Howard for this sacrifice of his time. He is one of those strenuous men of whom our President talks, who works about three-quarters of his time on matters of public interest. He has devoted himself at the call of this Association, every time willingly, and has given us much that is of interest and of educational value. I move you, therefore, that

a vote of thanks be extended to Mr. Howard for his valuable contribution. [Seconded and carried.]

Mr. Lowe—I would like to ask Mr. Howard a question. I very much appreciate the closing remarks made by him in reference to the antiquated methods at present in vogue by the coal producers of this Coast. I understand coal is mined in Washington at a comparatively low price. Probably the price asked by the producer there is fair enough, but when it reaches our market it is impossible to get it, even now, at less than $5 to $5.50 per ton. Is Mr. Howard familiar with the cost of mining coal in the East and its transportation over a similar distance, as is undertaken from the Washington fields to San Francisco, for instance, as a matter of comparative knowledge?

Mr. Howard—Yes, I know something about it. The State "Mineralogical Reports of the State of Pennsylvania" show that a large producer miner there produces coal at about $1.20 delivered on the cars at the mines, about 150 mines being operated. That is the average cost. Transportation to tidewater which is by rail will average perhaps $1.50 or $2 per ton. The tidewater shipping points to the points of consumption, vary according to the distance. The practice has been lately for the coal producer to own the transportation facilities, and in the anthracite field the coal is selling at about the same price as Washington Territory coal is selling here; the bituminous coal is selling at a good deal less than when there are normal conditions. The best coal produced in America from the south coal fields of Virginia, at one time last year, under the fight of the transportation companies, was as low as $1.35, free-on-board at Baltimore, and transported to Boston for about $1; to-day the $1.35 price is $2.50. The price has gone up, so you cannot buy the very highest grade of coals in the United States delivered at Boston, for less than $4.

Mr. Lowe—That strikes me as being the unreasonable status of the entire situation. I cannot understand why the transportation interests interfere with the mining interests. They stand in their own light, in view of the oil competition.

Mr. Howard—Not reading the lesson soon enough, Mr. Lowe.

Mr. Lowe—I guess you are right, Mr. Howard.

Mr. Britton—You make the assertion in your paper that you had determined, from observations and tests of other people in the use of oil and coal, that oil was 33⅓ per cent. cheaper than coal. What price of coal do you allude to?

Mr. Howard—That was an average statement. I found out from the data I had collected, for example among others, the test of the Southern Pacific Road with the coal they had used, and with other people the coal they had used, some showed economy as low as 50, some less, but as far as I could establish a figure, on an average it would be about 33⅓. That is the case with sugar factories where we have tried it. In one case it is more, and in the other case it is a little less; but I think it can be stated without any reference to any particular cases, that the average experience to the community is about 33⅓ per cent.

Mr. Clarke—I should think that, in the combustion of coal on locomotives, as Mr. Howard suggests, is not as good since they do not use their coal as well as it would be used under a stationary plant, and that would cut a figure as to the amount of oil used per ton of coal.

Mr. Howard—Nevertheless, the Southern Pacific test sheet shows that that is about the economy.

Mr. Clarke—For their road?

Mr. Howard—Yes, sir.

Mr. Clarke—But I think the economy of a stationary plant is greater.

Mr. Howard—That may be; but it will vary, too.

Mr. Clarke—Of course.

Mr. Britton—Do you know through your experience from people who have used it, whether or not air or steam has been deemed to be the most economical in the ejection of oil?

Mr. Howard—I have not been able to find out which is considered the more economical yet; but I know that air is considered the more satisfactory of the two.

Mr. Britton—Do the railroads use air or oil?

Mr. Howard—They use steam.

Mr. Holberton—Do you know what kind of burner the railroads generally use?

Mr. Howard—I do not.

Mr. Holberton—Has the Holden burner been used in this country at all?

Mr. Howard—I saw one in use on the Terminal Road, running from Los Angeles to San Pedro.

Mr. Holberton—Was it satisfactory?

Mr. Howard—Yes, sir.

Mr. Holberton—I know it is very much so in England.

Mr. Clarke—I might say that Admiral Melville has taken a great interest in the air burner. He thinks that the air blast used on the boilers in the marine and in the navy, will be a great thing, because the machinery that is necessary to drive the air blast is simpler than anything else. Air is the only thing to use in the navy or on board a ship, because you save the steam. The steam is not thrown out of the smokestack.

Mr. Howard—You have to use steam to compress your air.

Mr. Clarke—You get it back in the compressor.

Mr. Howard—In this case you do.

Mr. Lowe—Do you know anything as to the relative amount of steam required for driving a burner by air over the steam jet direct?

Mr. Howard—No, I do not. I had no means of finding out which was the more economical of the two, but it is generally regarded, I think, that the air is the better.

Mr. Lowe—My understanding of the matter has been that where steam was valuable air was usually used, but that the actual cost of operating by compressed air was in excess of that of the steam jet direct. I also understand that the intensity of the flame by the use of air is greater at a given point.

Mr. Howard—That depends on how you disperse your flame. On steam vessels the air plant would be preferred because of the saving of water, whereas you would waste it by the steam process

Mr. Clarke—As far as compressed air is concerned it would cost more to compress it, but Admiral Melville believes the air under a low pressure would be used at less expense, and that that experiment will be very successful.

Mr. Lowe—I think myself that that is true.

Mr. Britton—I would like to ask Mr. Howard, or any other member who has had experience, whether or not they have determined in their own minds that the best results were obtained by burning oil under pressure, say 40 pounds, as was commonly employed in the first uses of oil for fuel, or by gravity pressure at say 2½ or 2 pounds at the burner. That seems to be a mooted question at the present time amongst oil users as to which gives the better results.

Mr. Lowe—I have had considerable experience in that regard, and think it does not matter. If you are using extra light oil, gravity alone will answer. If, however, you are using a heavy oil, 14° or 15° Baumé, such as the Kern river oil, it will not easily pass through pipes, but will clog. There seem to be little lumps of heavy consistency, at times, that will interfere with the free passage of the oil, and we have found it absolutely necessary to apply pressure to overcome that difficulty, but that is the only reason. Under those circumstances we get a much steadier flame than to allow it to run by gravity.

The President introduced Mr. R. P. Valentine, Superintendent of the Capital Gas Company, Sacramento, Cal., who read the following paper on

GAS ADVERTISING.

In a paper[1] which I had the pleasure to present at our last annual meeting, I discussed to some extent the methods employed by our Company in increasing the demand for domestic fuel gas. That paper was largely an account of personal experience, the methods which I there advocated having all come under my own observation, and, in most cases, having been practiced by me. In the present instance, it is my intention to treat upon the subject of advertising in a much more general manner, criticizing and giving results where possible, and trusting that the gentlemen present will discuss the question more thoroughly, thus bringing out these methods which are most practicable and most serviceable under certain conditions.

There is probably no business which cannot be benefited by judicious advertising; in fact, that business seems to prosper best which is most freely and judiciously advertised. When one decides to advertise a commodity, he generally finds himself confronted by a serious question. It is the question of method. Of course, he may make use of the daily paper, which is an excellent medium, and one which I will discuss at some length, but he desires to advertise judiciously—to derive the greatest results from the least possible expenditure—and in his efforts to do so, he too often steps into a pitfall. There is no other subject possessing more phases than advertising, and it would be impossible to decide upon a set of rules; for different plans must be pursued and different methods employed under various circumstances. For that reason I trust the members present will dilate upon this article, thus giving the Association the benefit of their several experiences along the lines which follow.

Of course, the most prominent, and perhaps the most efficient, of all advertising mediums, is the daily newspaper. This agent is always at

1. See JOURNAL, Aug. 12, 1901, p. 247.

our disposal and always possesses attraction. Conducted properly, newspaper advertising is, in the majority of cases, a profitable investment, bringing abundant returns to the promoter; but, unless judgment is used, and a liberal amount expended, newspaper advertising is too liable to prove but a gambling venture, with the gas man on the losing side.

How many of you sit down each day and diligently peruse every column of advertising matter in your daily paper? How many of you manage to get through your paper without having your attention drawn a dozen times by an attractive "ad?" This is the parallel which the advertiser must bear in mind. Cheap, unattractive advertisements are ignored, while attractive and, therefore, expensive "ads.," are always absorbed, as it were, by the reading public. As a proof of this latter statement I may say that, in a recent advertising campaign, I displayed cuts of gas ranges in my newspaper advertisements, with the result that a great number of those who called at our office inquiring for gas stoves brought with them a clipping of our "ad.," with the request they be shown that particular kind of stove. Now, how many of those prospective customers, do you think, would have noticed our "ad." at all, if it had not been attractive?

Regarding newspaper advertising, Mr. C. A. Collins informs me as follows: "I have always favored the use of ample space in order to make advertising matter prominent. In a general way, the character of advertising has been on what might be called the 'Wanamaker' plan. That is, in calling the attention of the public to a given subject in a matter-of-fact and conversational style." Mr. John A. Britton, who does not believe in cuts, says that "The 'ads.' should be changed as often as once a week, and should be snappy, attractive reading matter."

"It is an obvious fact that it is the medium that most frequently reaches the reader that is most beneficial to the advertiser," says the Sacramento *Record Union*, which statement is undoubtedly correct to a considerable extent. It cannot be denied that newspaper advertising, being a daily interview, is cumulative in its results, because of persistent repetition and appeal.

For much of the information on newspaper advertising which follows I am indebted to Mr. William H. James, of the Sacramento *Evening Bee*:

From my own experiences and deductions, and the experiences of others of which I have knowledge. I am led to these conclusions:

1. Any article advertised must have real merit. If it possesses the element of novelty, so much the better.

2. In advertising an article the essential feature of economy should be brought out—economy in cost or in labor. This may be done with regard to anything that is worth advertising, even to patent medicines. My own opinion is that the large sale of medicines is due, not so much to the curative properties claimed for them, as to the opportunity afforded the man of moderate means to be cured at a comparatively small cost, as contrasted with the expense of physicians, hospitals and sanitariums.

3. The advertising should be carefully prepared, made at ractive in arrangement, kept fresh by frequent change of subject matter, and insertions ordered on some systematic basis; that is to say, at regular intervals, however infrequently space may be used.

4. Given, therefore, a meritorous article, advertising carried out on those general lines, with such slight modifications as experience and local conditions suggest, the results will, I think, be gratifying.

It would be heresy, indeed, to consider whether fuel gas has the required merit to render it worth advertising. Undoubtedly, there exists no question as to this in the mind of any one of us; but is the newspaper a profitable medium? I answer "Yes," and I speak from actual experience. I have used display advertising to good advantage, choosing a fair sized space on a good page, and ordering regular insertions for a year. The results were all that I could expect. I attended to changing the matter myself, seldom running the same copy a second time, and discussing in each advertisement some one feature of the article advertised—how the fuel bill could be materially reduced; how delay in the preparation of meals was obviated; how the housewife found life bearable, because of the absence of overpowering heat; how she could save labor in cleaning, in the total absence of ashes, etc.

In addition to display advertising I have used with conspicuous success news matter; that is, what newspapers denominate as "pure readers." I only employed this form of advertising, however, to bring out the risks taken where gasoline stoves are used. I watched the papers for instances of gasoline explosions (which are numerous enough) and, while the case was fresh in the public mind, had a "reader" inserted to suggest, in an entirely general way, the advantages of gas over gasoline as fuel.

While there are, as we all know, several methods of advertising which can be employed with profit, no energetic and sustained campaign can, in my judgment, be successfully carried on without the use of newspapers, which enter so largely into the everyday life of the American people.

Equally popular with newspaper advertising stands soliciting in its different forms. The house-to-house canvass by ordinary agents and by practical demonstrators, and the distribution of circulars, letters, and manufacturer's advertising matter.

The house-to-house canvass is, when practiced in the proper seasons of the year, the most gratifying in its results of any known method. A lengthy discourse on the canvassing plan is in my opinion unnecessary. Anyone who has carried on advertising to any extent will, I think, attest its merits.

Some time ago my Company engaged a solicitor who thoroughly canvassed that portion of town which was covered by our mains. Although this was regarded more of an experiment than anything else, and was carried on in the fall of the year, the most sanguine could not have anticipated the result obtained.

Perhaps it would be advisable to discuss the comparative merits of the practical demonstrator and the ordinary solicitor for this work.

My own opinion is that the employment of an ordinary solicitor, if he is a capable man, is more efficacious than the employment of a demonstrator, for the former will cover much more ground in a limited space of time, and will visit many more houses, while the latter will never fail to dilly-dally and will seldom benefit any except those who are customers of the Company.

Regarding the employment of a demonstrator for canvassing, Mr. Henry L. Doherty, of Denver, Col., reports to the "Novelty Advertising Department" of the Ohio Gas Light Association, as follows: "We keep a demonstrator out on what we call 'House Demonstrations.' A solicitor borrows a kitchen and invites in all the neighboring ladies who do not have gas stoves, and a demonstration is then given of scientific cooking on an up-to-date range, a display meter being attached to the supply pipe of the stove to show how much gas is used."

In the employment of a solicitor, it is advisable for the company to grant special concessions to new customers; a reduced price for connection, or a reduction in the price of the article will greatly augment the power of the solicitor. In employing a solicitor for the purpose of advertising gas ranges, the campaign should be confined to the early summer. In advertising gas lights, the soliciting should be confined to its proper season. This, of course, implies where a thorough and systematic house-to-house canvass is to be conducted. Many companies employ a solicitor the year round, in which case the soliciting is generally conducted intermittently. This is an excellent plan.

One of the most economical and most effectual methods cannot be passed by. The method I refer to is soliciting by means of circulars, letters, handbooks, and other advertising matter, distributed through the mail and personally.

I agree with several that this method should be practiced only under special conditions. The list, however, should include all persons living along the company's mains, whether customers or not. Many advertisers personally compile and make use of attractive and instructive circulars or pamphlets. An excellent, though expensive, plan is to distribute handbooks containing receipts, instructions on the care of the gas stove, directions for reading the meter and other general kitchen information.

My own advice is to draw upon the gas appliance manufacturers for all the serviceable advertising matter published by them. This matter is generally attractive and is very serviceable, when distributed along a newly piped district, and its economy cannot be questioned.

The Oakland Gas Light and Heat Company has a separate display and sales' store apart from the gas office. This store possesses all the modern appliances for the display of gas, both for fuel and lighting. It is exceedingly attractive, and the honorable President of that Company informs me that he considers it one of the best factors in gas advertising.

Many advertisers of gas stoves make displays of well cooked meats, bread, cake, etc., in their windows. This never fails to attract considerable attention, but should be carried on intermittently.

Advertisements placed in or upon street cars are conspicuous, and are a great aid in carrying out the general idea of always having your wares before the public.

Placing advertisements upon the backs of bills and upon letterheads and envelopes is a good help, but, of course, cannot be relied on to produce any marked result.

The advertiser should see that all cooking schools make use of gas

ranges, donating the stove and fuel if necessary. It is an excellent plan for a concern to give at regular intervals demonstrations in cooking, employing an expert cook. These demonstrations should be conducted in a hall, and every woman in town should be given an invitation. When popularity and public favor are desired, this plan is advisable.

The placing of exhibits in State and county fairs and other industrial expositions is an expensive method of advertising when properly carried out. The display must be as attractive as possible, and to conduct it properly, a cook must be employed to prepare and pass out freshly cooked delicacies. A display of this character always attracts hundreds of visitors, and very often proves an exceedingly profitable venture.

I have now submitted to you a bulk of the plans for gas advertising of which I have knowledge. In conclusion I have little to say, except that in order to advertise successfully it is necessary in my opinion to keep at it continually. To prevent tiresomeness, use a variety of methods that have proven successful, and now and then use some method of a novel character.

[To be Continued.]

Gas Cookers: Desirable to Companies and Consumers.

[A paper read at the last meeting of the Irish Association of Gas Managers, by MR. D. W. SYME, of Naas.]

It is with a desire towards increasing the sale of gas through the medium of gas cookers that I come before you to read this paper to-day. We live in an age of competition, and it is most deplorable to see the lack of interest generally shown by gas companies where their own interests are concerned. I admit that of late years a good deal has been done in the way of pushing gas cookers, but, to the discredit of our profession be it said, fully 95 per cent. of this pushing has been done by the enterprising manufacturers of gas cooking appliances.

Gas companies are formed for the purpose of making and selling gas, and I am persuaded that no better method of selling gas exists than that of encouraging the use of gas cookers. Now, seeing that we have so much practical proof to support us in this theory, I hold that it is the duty of everyone who is desirous of benefiting the gas industry to leave no stone unturned in order that gas companies may be made aware of the importance of this subject; with the result that they will acknowledge that gas cookers are most desirable. It is obvious that where gas is available the condition of the people generally would be improved by using cookers.

During the summer months managers, especially managers of small works, are often discouraged by the exceedingly great amount of unaccounted-for gas. Apart from condensation, I believe the chief reason for this lies in the fact that during non-lighting hours a fair amount of pressure has to be maintained in the mains for the sake of supplying a few straggling cookers, and perhaps an isolated gas engine. The leakage is thus abnormal, and in the almost microscopical output there is no compensation. If we reason from results already obtained by the use of gas cookers, then we can have no hesitation in trying to convince our respective companies that to encourage the sale of gas for cooking is a most profitable and safe investment; and with such facts before them there can be no excuse for gas companies adopting any penny wise and pound foolish policy, thereby crippling their own sources of revenue and handicapping their managers.

We have all heard of dividends being made in the retort house. We can heartily indorse this, provided we get a sale for the gas. But the day of waiting in our works for consumers to come to us is past, and any gas company that hesitates to encourage and advocate the use of cookers may hold itself ready for disaster. I believe the policy of supplying the people with cheap gas for cooking purposes is a good one, seeing that it is an inducement to the use of gas in a wholesale manner, and I invariably find that the nearest way to a man's heart is through his pocket. Much can be done by going from house to house, instructing consumers in the use and advantages of the modern gas cooker. Personally, I favor coming in contact as much as possible with consumers, thereby proving myself interested in their requirements. Thus we can gain their confidence; and the adoption of gas cookers generally follows, and our companies therefore must be convinced that gas cookers are desirable.

When summer weather is oppressive the coal fire with its superfluous heat is no desirable acquaintance. Yet, strange to say, people hesitate about adopting gas cookers, the general idea being that cooking by gas is very expensive. Now, nothing could be farther from the truth, for my experience convinces met hat, with gas at $1.25 per 1,000 cubic feet, in houses where it is used for all general purposes, the gas bill never exceeds 10 per cent. under a penny per head per diem. This compares favorably with coal at an average price; and we know that in Ireland, as a rule, the price of coal is excessive, owing to freight, etc. It may not be generally known, yet it is an acknowledged fact, that a joint cooked by the ordinary coal fire will weigh much lighter than if cooked by the gas oven. In cooking at the coal fire the outside of the joint is scorched before the center is reached by the heat, and thus the natural juices are expelled, and the most valuable portion of the roast meat is converted into a fibrous, sapless and practically indigestible mass.

Now, reflect for a moment. Let us imagine a portion of this reaching the stomach of a human being. What an extra amount of gastric juice it will require to reduce it to a pulp, and what an extra amount of hard labor it will inflict on the digestive organs. Now, with an up-to-date gas cooker, all this is reversed, for the oven being heated to a sufficient degree, the joint is surrounded by genial heat of a continuous uniform temperature deflected on all sides by the enamelled linings. The operator has complete control of the gas cooker, a thing which is an impossibility with the best coal fire; and I hold that such control is absolutely essential to perfect cooking.

Another objection held by many is the ancient idea that food cooked by gas must retain a gaseous flavor. This is a physical impossibility, for every schoolboy knows that when cooking is going on evaporation is continually taking place, thus rendering it impossible for anything objectionable to be absorbed, much less retained, by food cooked by a gas cooker. Gas is the spirit or vital principle of coal, and, being purified, must be much purer than the crude article from which it is taken. Gas cookers have much to recommend them to consumers, especially when attached to slot meters; no heavy accounts to pay, no dust or ashes, and no waste. They are always ready at any moment, day or night; and a gas cooker, being economical, is the friend of the people and a boon to humanity.

These, gentlemen, are a few of my own ideas concerning this most interesting branch of our industry; and whilst I am full aware of the imperfect manner in which they are put before you, yet I hope they may be instrumental in causing a discussion on this subject which may prove conducive to our mutual benefit. If this end be accomplished my primary object will be fulfilled, and I will realize gladly that my labor has not been in vein.

Regulations for Making Awards at the Louisiana Purchase Exposition.

The special rules and regulations providing for an International Jury and governing the system of awards at the Louisiana Purchase Exposition have been made public. As these rules will doubtless interest a number of our readers, an abstract follows:

The total number of jurors in the International Jury will be about 2 per cent. of the total number of exhibitors, and each nation having 50 exhibitors will be entitled to one juror. The number of jurors for each art or industry will also be, as nearly as possible, proportional to the number of exhibitors and importance of the exhibit.

United States jurors and alternates, the latter not exceeding in number one-fourth of the jurors, will be nominated by the Chief of Departments to which the groups belong. The foreign jurors will be nominated by the foreign commissioners. All nominations must be made not less than 30 days prior to the opening of the Exposition.

Each Group Jury will select a Chairman, Vice-Chairman and Secretary, and of the two first named officers, one must be an American citizen and the other from a foreign country represented in the Division of Exhibits. The Chief of each Department organizes and directs the Group Juries in his Department, and must be admitted to all meetings.

The work of the Group Juries will begin 30 days after the opening, and must be completed on or before 60 days after the opening of the Exposition. On the recommendation of the Chiefs of Department, and with the approval of the Director, experts may be called in special cases to report on the merits or demerits of exhibits; but these experts have no vote on the award.

Each Department Jury will be composed of the Chairman and Vice-Chairman of the Group Juries, with one member appointed by the Directory and one by the Board of Lady Managers. This Department Jury selects officers as before mentioned for the Group Juries. This Department Jury considers and reviews the reports of the Group Juries,

and is to harmonize any differences that may exist between Group Juries in the matter of awards. To this work 20 days may be devoted, when the findings of the Department Juries are submitted to the Directors of Exhibits, and within 10 days he shall receipt therefor and certify the same to the Superior Jury.

The Superior Jury will be made up as follows: President, the President of the Exposition; First Vice-President, the Director of Exhibits; Second Vice-President, a citizen of the United States named by the National Commission; Third and Fourth Vice-Presidents, the Commissioners General of the two foreign countries having the largest number of exhibits; and to these will be added the Chairmen and Vice-Chairmen of the Department Juries, the Chiefs of the Exhibit Department and one person appointed by the Board of Lady Managers. The Secretary of this Superior Jury may be selected at large by the members. This Superior Jury determines finally and fully all awards, though in case of dissatisfaction the exhibitor may, within three days after official notification, file a written notice of objection with the President of the Jury, and within seven days a written statement setting forth his views as to the award. The work of the Superior Jury must be completed 130 days after the opening of the Exposition, and the formal public announcement of awards made as soon after as practicable.

The deliberations of all juries will be strictly secret; the majority rules; and all exhibits of jurors are classed as non-competitive and are not to be examined. But if the exhibit of a juror is in another group, this rule does not hold.

Whenever applicable, a decimal scale system is to be used in judging the merits of exhibits, 100 representing perfection. Exhibits receiving markings ranging from 60 to 74 will be awarded a bronze medal; from 75 to 84, a silver medal; from 85 to 94, a gold medal; from 95 to 100, the Grand Prize.

The compensation of foreign jurors will be fixed and paid by the countries they represent. United States jurors, except such as are officers and employees of the Exposition, will receive necessary and actual cost of transportation and a compensation at the rate of $7 per day for the time actually engaged in the work assigned them.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE properties of the Marietta (O.) Gas Company have been merged with those of the Marietta Fuel Gas Company, the name of the succeeding corporation being that of the Marietta Consolidated Gas Company, the proprietors of which propose to furnish natural gas for fuel and light. The manufacture of gas has been stopped, of course, and the management and control have gone over to the former owners of the Fuel Gas Company. Mr. David S. Milne, former Secretary and Manager of the Marietta Gas Company, is settling up its affairs, which will probably be all closed up by October 1st.

MESSRS. ADAM WEBER SONS, of New York, inform us that the following orders for the style of chimney advertised in the JOURNAL some time ago are on their books: 22, for the Lackawanna Iron and Steel Company, Buffalo, N. Y.; 2, for the White Mountain Paper Company, Portsmouth, N. H.; 1 each, for the Lynn (Mass.) Gas and Electric Company; Central Union Gas Company, of New York City; New Haven (Conn.) Gas Light Company, and the Milwaukee (Wis.) Gas Light Company. Mr. Oscar R. Weber, as a friend who is concerned in one of these contracts says, has developed much nautical strength this summer.

THE holder constructed by Messrs. Deily & Fowler, of Philadelphia, for the Mahanoy City (Pa.) Gas Company, has been satisfactorily completed.

THE Town Board of Floral Park, Long Island, which place is not so very far from Hempstead, has authorized the Floral Park Light and Power Company to erect poles and string wires for the carrying of electric currents; also, to lay gas mains for the conveying of gas for lighting, heating, and power uses.

MANAGER A. H. BRANCH reports that satisfactory progress is being made in the construction of the plants for the Oklahoma Gas and Electric Company. It is thought that the electric division of the Company will be ready for commercial working before December 1st.

THE offices of the Boone (Ia.) Gas Company have been removed to spacious, well fitted quarters in the Wells Building.

IN the combined case of the New England Gas and Coke Company versus Whitney *et. at*, trustees, and the Central Trust Company, of New York, versus the same, now on in the United States Circuit Court, the defendants have filed an answer admitting all the allegations contained in the bills, and consenting to a decree of foreclosure. This will expedite very much the final settlement of a very mixed case.

A CORRESPONDENT in Ottawa, Can., forwards the following, under date of August 23d:

The Ottawa Gas Company has raised the rate for fuel gas from $1 per 1,000 cubic feet to $1.10, at which rate it will remain until the cessation of the coal strike, when it is the intention to resume the old rate. The Company in an explanatory circular to customers states: "Owing to the scarcity of anthracite coal and consequent rise in price—which it is hoped will be temporary—combined with additional advances in wages and oil used for manufacturing purposes, the Gas Company is compelled to make a slight change in the discount arrangements for fuel gas only, which will, it is thought, meet the necessities of the situation. This alteration will go into effect on October 1 next, and will be as follows: To all consumers using gas for fuel purposes only the discount will be 12 per cent., instead of 20 per cent., as heretofore, but to all those using at least 2,000 cubic feet per quarter for lighting purposes, an extra discount of 4 per cent. will be given on fuel gas, making the same 16 per cent."

WE are informed that Mr. Edward C. Burton, formerly Secretary of the D. Trainer & Sons Manufacturing Company, has been appointed chief of the clerical staff of the Suburban Gas Company, of Philadelphia, with offices at Chester, Darby and Media.

MESSRS. LINDSAY & COMPANY, 170 Lake street, Chicago, have completed arrangements with the General Gas Light Company, of Kalamazoo, Mich., whereby the former are authorized to offer to gas companies the Humphrey gas arc lamps, at manufacturers' prices, F. O. B., Chicago.

THE Orby & Gilliland Company, of Memphis, Tenn., is preparing to construct a factory in Waterbury, Conn., for the manufacture of gas burners.

THE authorities of Winona, Minn., have decided to construct an electric lighting plant, to be operated in connection with the local water works system on municipal account.

MR. R. W. WAITE, as Secretary and Treasurer of the United Gas and Electric Company, of New Albany and Jeffersonville, Ind., is in full charge of the financial ends of that enterprise.

THE offices of the Waterbury (Conn.) Gas Company have been removed to spacious and well furnished quarters in the modern office building, corner of Center and Leavenworth streets.

MR. J. C. NORCROSS has resigned the position of Superintendent to the Spartanburg (S. C.) Railway, Gas and Electric Company. We understand that his resignation was the preliminary to his accepting an important position with a Massachusetts Company, the name of which was not given to us.

ALL the arrangements for the betterment of the gas division of the properties of the Council Bluffs, Ia., Citizens Gas and Electric Company have been made by Mr. W. H. Fritchman, the Company's General Manager. The plans, among other things, call for the necessary buildings to house a modern purifying plant and station meter service. The engineering details of the work are to be under the direction of Mr. W. H. Hayden.

MR. GEORGE P. SMITH, acting for himself and other minority shareholders in the Niagara (N. Y.) Light, Heat and Power Company, brought suit for an injunction to restrain the Company from selling its properties in Tonawanda, N. Y., to a syndicate headed by Mr. W. T. Morris, of Ithaca, N. Y. The sale had been regularly made, and Mr. Morris and his associates had kept good faith as to their promises in connection with the trade. They aver that the price agreed on ($125,000) was an equitable one to the owners, and they also assert that they have been much injured through the action taken by Smith and his minority. Smith's basis of claim is that the sale should be annulled because the agreed on price is not within 50 per cent. of the real value of the property. The argument was made before Judge Kenefick, of the Supreme Court, who reserved his decision.

MR. JOHN T. GAFFEY has applied to the authorities of San Pedro, Cal., for the right to there operate a gas works, with an electric annex.

IT is said that Philadelphia capitalists have secured control of the gas plants in Osaka and Tokyo, Japan. We are inclined to doubt the statement, especially in respect of Tokyo, the proprietors of which plant know its full value, to the weight of a "yen."

CURRENT newspaper despatches are to the effect that a syndicate of capitalists, in Chicago and Cincinnati, represented by Messrs. H. M. Byllesby and W. N. Horner, of Chicago, and Rudolph Dreibelt & Co., of Cincinnati, aided by Messrs. Turner & Holder, of Bellville, and Messrs. Stephens, Turner & Foreman, of East St. Louis, have purchased the plants of the Belleville (Ills.) Gas, Electric Light and Coke Company. According to the story the new owners propose to connect the cities of Belleville and East St. Louis—they are about 15 miles apart—to one system of gas and electric light supply, the connecting mains and wires to be placed under and over the bed of the St. Clair County Rock Road, which joins the two cities. The scheme looks a bit on the uncertain side, even though the road between the named points will afford many consumers of gas and electricity, on acoount of the engineering difficulties that will have to be overcome.

THE Ormsby Gas Company, of Newton, McKean County, Pa., has been incorporated with a capital of $30,000.

MR. WORTHINGTON SCRANTON has been appointed Assistant President to the Scranton (Pa.) Gas and Water Company. His father, Mr. W. W. Scranton, has been the presiding genius of the named properties for over two score years.

MR. GEORGE N. CRANDALL, who some years ago was prominent in the affairs of the Attleboro (Mass.) Gas Light Company, died at his home in Attleboro, the afternoon of August 17th. Deceased was born in Charlestown, R. I., October 27, 1819, and maintained an active interest in his many business pursuits until stricken by paralysis towards the close of last May.

MR. THOMAS RANKIN, of Chicago, has applied to the authorities of Beaver Dam, Wis., for the right to construct and operate a gas works in the named place. The petitioner agrees to furnish gas on public account at the rate of 90 cents per 1,000 cubic feet, the rates on private account to be: Those using less than 3,000 cubic feet per month, $1.50 per 1,000; over 3,000 cubic feet per month, $1.35 per 1,000.

THE gas plants at Evanston, Cicero and Blue Island, Ills., have been merged under the title of the Northwestern Gas Light and Coke Company, with a bonded and stock debt of $10,000,000—half bonds and half stock. The officers are: Directors, Jno. B. Walsh, T. M. Jackson, N. A. McClary, Jno. A. Spoor, W. P. Martin, G. H. Gunderson and A. S. Trude; President, N. A. McClary; Vice-President, W. P. Martin; Treasurer, T. M. Jackson; Secretary, Richard Rees.

THE following extracts are from the annual report of Mr. S. C. Ford, Inspector of Gas and Meters for the District of Columbia, respecting the operations of his office for the fiscal year ended June 30, 1902: "The mean average illuminating power of the gas supplied by the Washington Gas Light Company during the year was 0.20 of a candle higher than that supplied in 1901. The mean average illuminating power determined at the three laboratories, was found to equal 26.22 standard candles. The maximum average illuminating power was found to equal 29.67 standard candles, and the minimum 23.60. The average illuminating power of the gas, determined at the central laboratory, corner Tenth and D streets, northwest, was found to equal 26.05 standard candles. The maximum illuminating power was 28.56 standard candles. The minimum illuminating power was 23.42 standard candles. The average illuminating power of the gas determined at the southeast laboratory, corner Fifth and D streets, southeast, was found to equal 26.36 standard candles. The maximum illuminating power was 31.02 standard candles. The minimum illuminating power was 23.36 standard candles. The average illuminating power of the gas determined at the northwest laboratory, 1335 Fourteenth street, northwest, was found to equal 26.25 standard candles. The maximum illuminating power was 29.44 standard candles. The minimum illuminating power was 24.03 standard candles. On only one occasion during the year was ammonia in excess of the amount allowed by law, and at no time during the year was sulphur found in excess of the maximum amount allowed by law. The Washington Gas Light Company was in default in candle power on 20 occasions during the year, as follows: Central laboratory, seven; southeast laboratory, seven; northwest laboratory, six; by average of all three laboratories there was but one default. The average illuminating power of the gas supplied by the Georgetown Gas Light Company during the year ending June 23, 1902, was 0.28 of one candle less than during the year 1901. The average illuminating power of the gas determined at the laboratory, 1338 Thirty-second street, was found to equal 27.61 standard candles. The highest illuminating power during the year was 32.84 standard candles. The lowest illuminating power during the year was 21.14 standard candles. On 9 occasions during the year this Company was in default in candle power. Sulphureted hydrogen was present on 11 occasions during the year, and on 11 occasions ammonia was found in excess of the amount allowed by law. At no time during the year was sulphur in excess of the amount allowed by law. Eight hundred and seventy-nine photometric inspections were made of the gas supplied by the Washington Gas Light Company, and 290 inspections of the gas supplied by the Georgetown Gas Light Company, during the year. During the year this office inspected and proved 4,965 gas meters. With the exception of 4 meters inspected for the Alexandria gas works, the above mentioned meters were inspected for the Washington and Georgetown Gas Light Companies, and for consumers of gas in Washington and Georgetown. Two hundred and ninety-six of the said meters registered fast, average error, 4.47 per cent.; 522 registered slow, average error, 8.88 per cent.; 3,923 registered within the limits allowed by law, and 224 did not register the gas flowing through them. One thousand three hundred and thirty-nine of the above mentioned meters were removed from service on complaints of the Washington and Georgetown Gas Light Companies, and consumers of gas in Washington and Georgetown. Six hundred and twelve were complained of by consumers of gas, they believing the meters to register incorrectly. Two hundred and fifty-four registered fast, average error, 4.58 per cent.; 58 registered slow, average error, 3.48 per cent., and 300 registered within the limits allowed by law. Seven hundred and twenty-six were complained of by the Washington Gas Light Company; 20 registered fast, average error, 5.20 per cent.; 462 registered slow, average error, 24.60 per cent.; 20 registered within the limits allowed by law, and 224 did not register the gas flowing through them. One meter was complained of by the Georgetown Gas Light Company. Said meter registered 5 per cent. fast. All of the meters complained of by the Washington Gas Light Company were removed from service and tested in the Company's shop before being brought to this office for inspection. Two thousand one hundred and thirty-nine dollars and fifty cents were received by this office for the inspection of gas meters, which amount was paid to the collector for the district. The recommendation made in the annual reports of this office for a number of years past, that the Gas Companies in the District of Columbia be required to make a more suitable rebate than they allow at present in cases where meters complained of by gas consumers are found by the Inspector to register in excess of the requirements of law, is again renewed. The same course should be followed where meters are found to register fast, as is pursued by these companies where meters are found to register slow or fail to register at all; or a similar course should be required to that adopted by the New York and Baltimore Gas Companies."

"I WONDER how many of my brother engineers," asks a writer in the *Engineer*, "know that the diameter of a circle, or a pipe, with an area equal to that of any two other ones, may be found without any calculation by means of nothing but the square corner of a board and a rule. The process is simply to lay off the two diameters on the two edges of the board and measure diagonally from one to the other. If you have a carpenter's square the process is reduced to the simple diagonal measurement. Where three or more pipes are to be led into one, convert two into an equivalent and work as with only two pipes. I find this simple method of great assistance in the engine room, as you can see at a glance, almost, what size pipe is required without any calculation."

THE *Journal of Gas Lighting* notes that in the Lycée at San Marino, there is a curious model of a gas locomotive which was discovered by Professor Borbiconi in a cupboard. It appears to have been constructed with the idea of showing how carbonic acid could be disengaged from one of its compounds by attacking a carbonate by an acid. The locomotive was presented to the collection by a lawyer named Angeloni, between October 1, 1867, and March 30, 1868, and was catalogued as "Gas locomotive, constructed to demonstrate how this force can replace that of steam." This model was apparently constructed before Lenoir came out with his motor.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
MANAGER.

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OHIO GAS LIGHT ASSOCIATION.
PACIFIC COAST GAS ASSOCIATION

Notification Respecting Advertising.—Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:
New York—American News Co. 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, SEPTEMBER 1, 1902.

The Market for Gas Securities.

The market for local gas securities, quite contrary to the usual custom of the end of the summer season, took on much animation during the week. Consolidated was dealt in on a fairly large scale, and while the range of prices was somewhat higher than that of a week ago, the net result is a gain of only one-half point in the bid price. The closing to-day (Friday) was made at 223½ to 224½ with the last sale at 224. Chief Bradley and his engineering associates are about ready to make a positive start on the planned construction at Astoria, and it may be taken for granted that the new plant will be up to the best, the world over.

The "surprise" of the week (though why anyone should really be surprised at the development is beyond us) was the smart advance in Brooklyn Union, which sold at 254 one time. It closed at 249 to 250. Our prediction of 300 before Christmas is repeated. The advance, of course, means the approach of closer relations between Brooklyn Union and Consolidated. The owners of the latter, however, in the instance of the Brooklyn deal, know full well that the Brooklynites want money, good money, for their properties.

The gas share market in general is strong. Peoples, of Chicago, and Washington, D. C., are seemingly sluggish, but in regard to the latter the sluggishness is more apparent than real. Baltimore gas is steady. Insiders say that the electric folks in Baltimore are fully appreciating the fact that the "Mountain will not go to Mahomet."

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

SEPTEMBER 1.

☞ All communications will receive particular attention.
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	223¾	224½
Central Union, Bonds, 5's.	3,000,000	1,000	110	112
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	118	120
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	350	..
Municipal Bonds	750,000	..	..	..
New Amsterdam Gas Co. Bonds, 5's	11,000,000	1,000	112½	113
Northern Union, Bonds, 5's.	1,250,000	1,000	108	110
New York and East River Bonds 1st 5's	3,500,000	1,000	112	113
" 1st Con. 5's	1,500,000	.	109	111
Richmond Co., S. I.	348,650	50	100	..
" Bonds	100,000	1,000	103	..
Standard	5,000,000	100	130	140
Preferred	5,000,000	100	150	160
Bonds, 1st Mortgage, 5's	1,500,000	1,000	114	117
Yonkers	299,650	500	130	.
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	249	250
" " Bonds (5's)	15 000,000	1,000	119	119½
Bay State	50,000,000	50	1¾	2
" Income Bonds	2,000,000	1,000	.	75
Binghamton Gas Works	450,000	100	28	30
" 1st Mtg. 5's	509,000	1,000	93	96
Boston United Gas Co.— 1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	11	13
" " Bonds, 5's	5,250,000	1,000	83¾	85
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000		
Central San Francisco	2,000,000	..	106	108
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Cincinnati Gas & Elec. Co.	29,500,000	100	103¼	103½
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	101	101½
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	88¼	89½
Preferred	3,026,500	100	107½	109
Consumers, Jersey City Bonds	600,000	1,000	102	103
Consumers, Toronto	1,700,000	50	218	225
Consolidated, Baltimore	11,000,000	100	72½	73¾
Mortgage, 6's	3,600,000	..	..	115
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000		.	112
Consolidated Gas Co. of N.J.	1,000,000	100	15	17
" Con. Mtg. 5's	380,000	1,000	85	87
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co.	4,825,500	50	.	89
" Prior Lien 5's	5,603,000	1,000	99½	100
Detroit Gas Co., 5's	382,000	1,000	77	79
" Inc. 5's	16,000	100	94	94½
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Essex and Hudson Gas Co.	6,500,000	..	34	38
Fort Wayne	2,000,000	..	.	.
" Bonds	2,000,000	..	58	63
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	245	265
Hudson County Gas Co., of New Jersey	10,500,000	..	25	..
" Bonds, 5's	10,500,000	..	101	103
Indianapolis	2,000,000	..	70	80
" Bonds, 6's	2 650,000	..	102¾	104½
Jackson Gas Co	250,000	50	73	75
" 1st Mtg. 5's	290,000	1,000	101	102½
Kansas City Gas Light Co., of Missouri	5,000,000	100	..	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	83	87x
Preferred	2,500,000	100	100	106
Bonds	10,000,000	1,000	109½	110
Lafayette Gas Co., Ind.	1,000,000	100		60
Bonds	1,000,000	1,000	58	64
Louisville	2,570,000	50	112	120
Madison Gas & Elec. Co. " 1st Mtg. 6's	350,000	1,000	107½	108½
" 6 per cent. scrip, due 1910	100,000	25	25	87
Montreal, Canada	2,000,000	100	182	184¾
Newark, N. J., Con. Gas Co	6,000,000	..	56	58
Bonds, 6's	4,600,000	..	105	105¾
New Haven	1,000,000	25	300	325
Nashville Gas Lt. Co.	1,000,000	100	110	..
Oakland, Cal.	2,000,000	..	46	47
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	104½	104¾
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	..	..
2d "	2,500,000	1,000	104	
Rochester Gas & Elec. Co.	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	48	48½
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgage 6's.	650,000	1,000	113	116
Extension, 6's.	600,000	1,000	112½	115
General Mortgage, 5's.	2,465,000	1,000	92	93
St. Joseph Gas Co. " 1st Mtg. 5's	751,000	1,000	95	96½
Syracuse, N. Y.	1,975,000	100	27	30
Bonds	2,647 000	1,000	86	90
Washington, D. C	2,600,000	20	375	377½
First mortgage 6's	600,000	..	..	..
Western, Milwaukee, Bonds, 5's	4,000,000	..	109½	110
Wilmington, Del.	600,000	50	232	..

Advertisers' Index.

GAS ENGINEERS. Page

Wm. Henry White, New York City ... 319
Fred. Bredel, Milwaukee, Wis. ... 306
Geo. R. Rowland, New York City ... 306
The Western Gas Construction Co., Fort Wayne, Ind. ... 288
Humphreys & Glasgow, New York City ... 317
David Leavitt Hough, New York City ... 316
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 313
Baxter & Young, Detroit, Mich ... 318
United Gas Improvement Co., Philadelphia, Pa ... 311
James T. Lynn, Detroit, Mich ... 316
A. E. Boardman, Brevard, N. C ... 316
The Jeffrey Manufacturing Co., Columbus, O ... 314

GAS WORKS APPARATUS AND CONSTRUCTION.

Continental Iron Works, Brooklyn, N. Y. ... 316
Deily & Fowler, Philadelphia, Pa ... 320
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 316
Stacey Mfg. Co., Cincinnati, Ohio ... 319
Bartlett, Hayward & Co., Baltimore, Md ... 317
Davis and Farnum Mfg. Co., Waltham, Mass ... 316
R. D. Wood & Co., Philadelphia, Pa ... 318
Isbell-Porter Company, New York City ... 318
Fred. Bredel, Milwaukee, Wis ... 306
United Gas Improvement Co., Philadelphia, Pa ... 311
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 313
The Western Gas Construction Co., Fort Wayne, Ind. ... 288
Humphreys & Glasgow, New York City ... 317
Logan Iron Works, Brooklyn, N. Y ... 320
Riter-Conley Mfg. Co., Pittsburg, Pa ... 319
Baxter & Young, Detroit, Mich ... 316
G. Shepard Page's Sons, New York City ... 316
James T. Lynn, Detroit, Mich ... 316
A. E. Boardman, Brevard, N. C ... 316
Christopher Cunningham, Brooklyn, N. Y ... 304
The Jeffrey Manufacturing Co., Columbus, O ... 314
Quintard Iron Works, New York City ... 313
The Connersville Blower Company, Connersville, Ind. ... 321
Lloyd Construction Co., Detroit, Mich ... 305
Connelly Iron Sponge and Governor Co., New York City 271

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md ... 317
United Gas Improvement Co., Philadelphia, Pa ... 311
Burdett Loomis, Hartford, Conn ... 318
Economical Gas Apparatus Construct'n Co, Toronto, Ont. 313
The Western Gas Construction Co., Fort Wayne, Ind. ... 288
Humphreys & Glasgow, New York City ... 317
B. E. Chollar, St. Louis, Mo ... 303

SCRUBBERS AND CONDENSERS.

R. D. Wood & Co., Philadelphia, Pa ... 318
Continental Iron Works, Brooklyn, N. Y ... 318
Logan Iron Works, Brooklyn, N. Y ... 320
Riter-Conley Mfg. Co., Pittsburg, Pa ... 319
The Western Gas Construction Co., Fort Wayne, Ind. ... 288

PRODUCER POWER PLANTS.

R. D. Wood & Co., Philadelphia, Pa..... 318

TAR AND CARBONIC ACID EXTRACTOR.

The Western Gas Construction Co., Fort Wayne, Ind... 288

AMMONIA CONCENTRATORS.

Michigan Ammonia Works, Detroit, Mich..... 308
The Western Gas Construction Co., Fort Wayne, Ind... 288

GAS METERS.

John J. Griffin & Co., Philadelphia, Pa..... 324
American Meter Co., New York and Philadelphia..... 328
Helme & McIlhenny, Philadelphia, Pa..... 323
D. McDonald & Co., Albany, N.Y..... 321
Nathaniel Tufts Meter Co., Boston, Mass..... 322
Maryland Meter and Mfg. Co., Baltimore, Md..... 322
Metric Metal Co., Erie, Pa..... 323
Keystone Meter Co., Royersford, Pa..... 322
Detroit Meter Company, Detroit, Mich..... 323

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia..... 328
John J. Griffin & Co., Philadelphia, Pa..... 324
D. McDonald & Co., Albany, N.Y..... 321
Helme & McIlhenny, Philadelphia, Pa..... 323
Nathaniel Tufts Meter Co., Boston, Mass..... 322
Keystone Meter Co., Royersford, Pa..... 322

GAS AND WATER PIPES.

M. J. Drummond & Co., New York City..... 308
R. D. Wood & Co., Philadelphia, Pa..... 308
Warren Foundry and Machine Co., New York City..... 306
Donaldson Iron Co., Emaus, Pa..... 308
Christopher Cunningham, Brooklyn, N.Y..... 304
Charles Millar & Son Co., Utica, N. Y..... 308

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., N.Y. City..... 308

GAS TAPPING MACHINES.

George Light, Dayton, O..... 308
H. Mueller Manufacturing Company, Decatur, Ills..... 305

GAS COALS.

Perkins & Co., New York City..... 314
Westmoreland Coal Co., Philadelphia, Pa..... 313
Berwind-White Coal Mining Co., New York and Phila.. 314

CANNEL COALS.

Perkins & Co., New York City..... 314

CONVEYORS.

The Link-Belt Machinery Co., Chicago, Ills..... 315
The Western Gas Construction Co., Fort Wayne, Ind... 288
The Jeffrey Manufacturing Co., Columbus, O..... 314
C. W. Hunt Company, New York City..... 305

GAS ENRICHERS.

Standard Oil Co., New York City..... 315
The Sun Oil Co., Pittsburg, Pa..... 315

COKE CRUSHERS.

C. M. Keller, Columbus, Ind..... 315
The Jeffrey Manufacturing Co., Columbus, O..... 314

STEAM BLOWER FOR BURNING BREEZE.

H. E. Parson, Brooklyn, N.Y..... 313
The Connersville Blower Company, Connersville, Ind... 321

ECONOMIZERS.

Green Fuel Economizer Co., Matteawan, N.Y..... 304

GAS GAUGES.

The Bristol Co., Waterbury, Conn..... 314

GAS GOVERNORS.

Connelly Iron Sponge and Governor Co., New York City 271
Isbell-Porter Co., New York City..... 318
R. D. Wood & Co., Philadelphia, Pa..... 318

CEMENTS.

C. L. Gerould, Galesburg, Ills..... 312

RETORTS AND FIREBRICKS.

J. H. Gautier & Co., Jersey City, N. J..... 312
Adam Weber Sons, New York City..... 312
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 312
Cyrus Borgner, Philadelphia, Pa..... 312
James Gardner, Jr., Co., Pittsburg, Pa..... 312
Henry Maurer & Son, New York City..... 312
Baltimore Retort and Firebrick Co., Baltimore, Md..... 312
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 312
Brooklyn Firebrick Works, Brooklyn, N. Y..... 312
Missouri Firebrick Co., St. Louis, Mo..... 312

REGENERATIVE FURNACES.

Bartlett, Hayward & Co., Baltimore, Md..... 317
Fred. Bredel, Milwaukee, Wis..... 306
J. H. Gautier & Co., Jersey City, N.J..... 312
Parker-Russell Mining and Mfg. Co., St. Louis, Mo..... 312
Adam Weber Sons, New York City..... 312
Laclede Firebrick Mfg. Co., St. Louis, Mo..... 312
Missouri Firebrick Co., St. Louis, Mo..... 312

SELF-SEALING MOUTHPIECE DOORS.

Isbell-Porter Co., New York City..... 318
Continental Iron Works, Brooklyn, N.Y..... 318
Logan Iron Works, Brooklyn, N.Y..... 320
R. D. Wood & Co., Philadelphia, Pa..... 318
The Western Gas Construction Co., Fort Wayne, Ind... 288

CHIMNEY CONSTRUCTION.

Adam Weber Sons, New York City..... 312

INCANDESCENT GAS LAMPS.

Welsbach Company, Gloucester, N. J..... 310
General Gas Light Company, Kalamazoo, Mich..... 305
D. M. Steward Mfg. Co., Chattanooga, Tenn..... 304
Detroit Arc Gas Light Co., Detroit, Mich..... 308

BURNERS.

C. A. Gefrorer, Philadelphia, Pa..... 308
Wm. M. Crane Co., New York City..... 305
D. M. Steward Mfg. Co., Chattanooga, Tenn..... 304
Sunlight Lava Mfg. Co., Chattanooga, Tenn..... 303

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn..... 304
Sunlight Lava Mfg. Co., Chattanooga, Tenn..... 303

STREET LAMPS.

Welsbach Street Lighting Co., New York and Phila.... 310
Thos. T. W. Miner, New York City..... 308

PURIFIERS.

R. D. Wood & Co., Philadelphia, Pa..... 318
Stacey Mfg. Co., Cincinnati, O..... 313
The Western Gas Construction Co., Fort Wayne, Ind... 288

PURIFYING MATERIALS.

Connelly Iron Sponge and Governor Co., New York City 271

VALVES.

Ludlow Valve Manufacturing Co., Troy, N.Y..... 305
R. D. Wood & Co., Philadelphia, Pa..... 318
Continental Iron Works, Brooklyn, N. Y..... 318
The P. H. & F. M. Roots Co., Connersville, Ind..... 307
Isbell-Porter Co., New York City..... 318
The Western Gas Construction Co., Fort Wayne, Ind.... 288
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 316

EXHAUSTERS.

The P. H. & F. M. Roots Co., Connersville, Ind..... 307
Isbell-Porter Company, New York City..... 318
Connelly Iron Sponge and Governor Co., New York City 271
Kerr Murray Mfg. Co., Fort Wayne, Ind..... 316
The Connersville Blower Company, Connersville, Ind... 321

ELECTRICAL APPARATUS.

Wm. Henry White, New York City..... 319

BOILERS, STACKS, TANKS, ETC.

The Hazelton Boiler Company, Rutherford, N.J..... 308

PURIFIER SCREENS.

John Cabot, New York City..... 314

GAS STOVES.

American Meter Co., New York and Philadelphia..... 309
Maryland Meter and Manufacturing Co., Baltimore, Md 322
Keystone Meter Co., Royersford, Pa..... 322
Nathaniel Tufts Meter Co., Boston Mass..... 322

HOT WATER HEATERS.

The Humphrey Mfg. and Plating Co., Kalamazoo, Mich. 308

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N.Y..... 306

(*Continued on page* 303.)

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(*Concluded from page 302.*)

GASHOLDERS.

Bartlett, Hayward & Co., Baltimore, Md..... 317
Continental Iron Works, Brooklyn, N.Y..... 318
Deily & Fowler, Philadelphia, Pa..... 320
Davis & Farnum Mfg. Co., Waltham, Mass..... 316
Kerr Murray Mfg. Co., FortWayne, Ind..... 316
Stacey Mfg. Co., Cincinnati, O..... 319
R. D. Wood & Co., Philadelphia, Pa..... 318
Logan Iron Works, Brooklyn, N Y..... 320
Riter-Conley Mfg. Co., Pittsburg, Pa..... 319

STORAGE TANKS.

Christopher Cunningham, Brooklyn, N.Y..... 304

INVESTORS.

W. R. Faben Construction Company, Toledo, O..... 308

BOOKS, ETC.

Newbigging's Handbook..... 322
Field's Analysis, 1901..... 313
Gas Flow Computers..... 315
Excerpts from Reports of Gas Commissioners..... 323
Directory of Gas Companies..... 319
Gas Engineer's Laboratory Handbook..... 318
Gas Engineer's Pocket-Book..... 317
Poole on Fuels..... 315
Practical Photometry..... 320
Practical Handbook on Gas Engine..... 313
Hughes' "Gas Works"..... 308
Coal Tar Tree..... 306
Electric Gas Lighting..... 312
Binders..... 315

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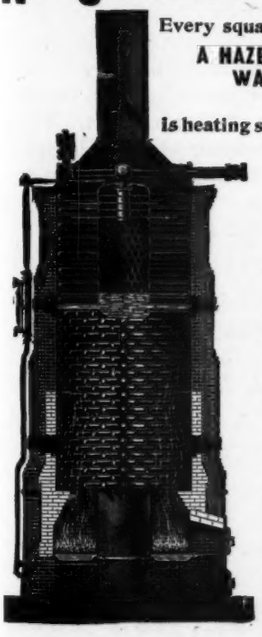

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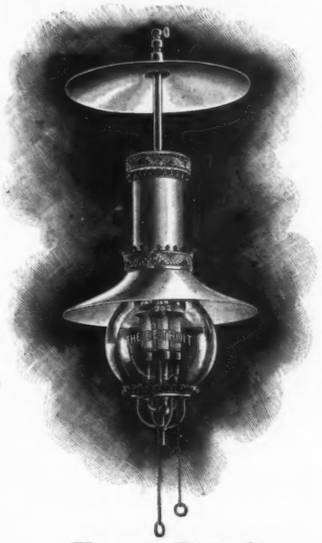

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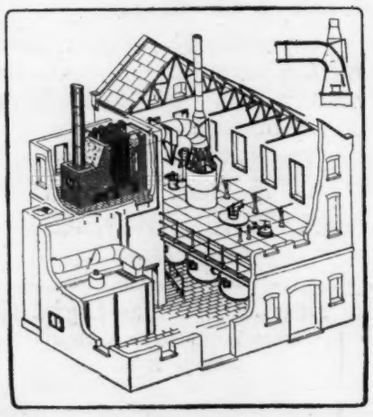

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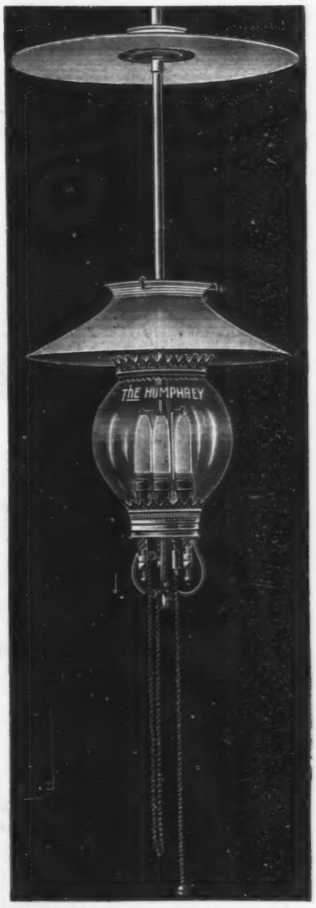

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CONNELLY IRON SPONGE AND GOVERNOR COMPANY,

395 Broadway, New York City,

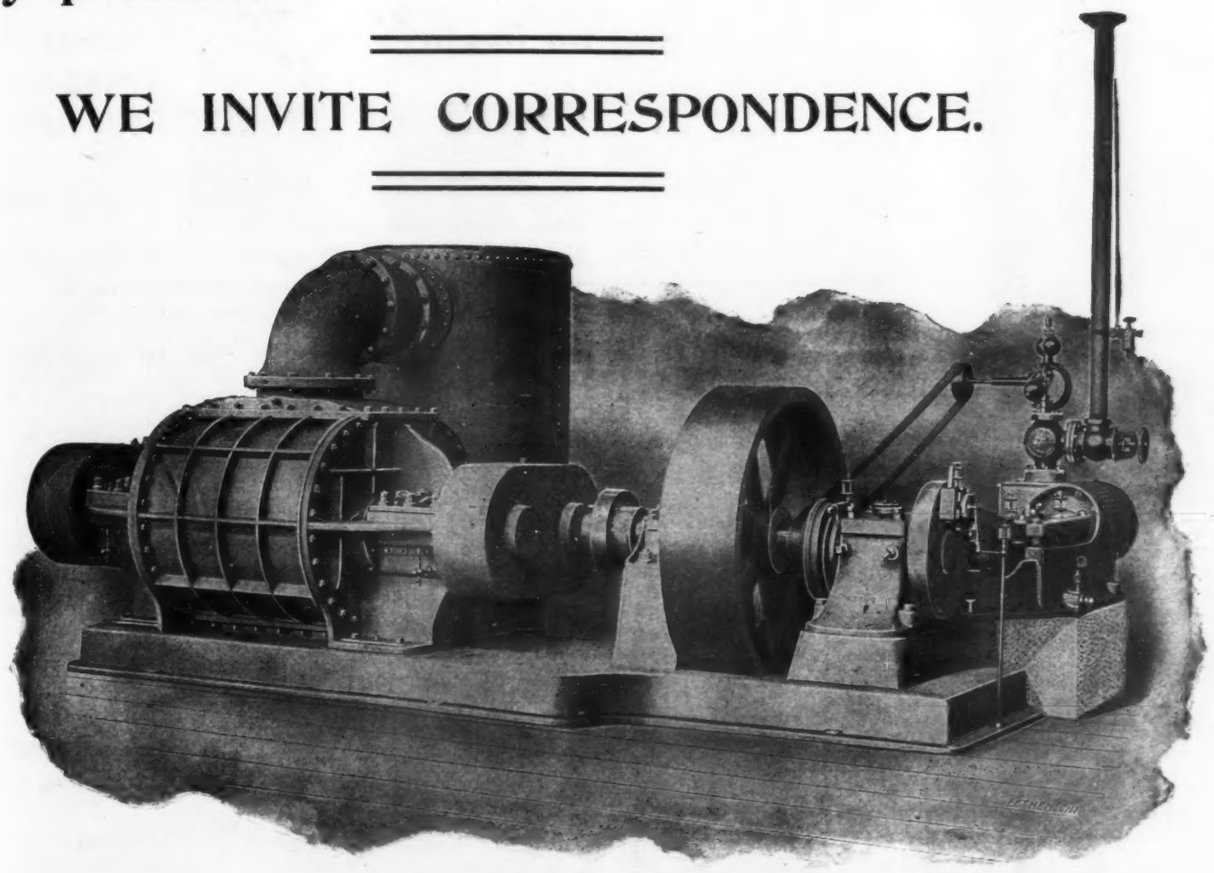
Occupies this Space Every Alternate Week.

ROOTS'

HORIZONTAL GAS EXHAUSTER.

WE are building a line of Exhausters as per cut herewith, for forcing gas long distances and under pressures that are higher than ordinary pressures.

WE INVITE CORRESPONDENCE.



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HOME OFFICE: Connersville, Ind. NEW YORK OFFICE: 109 Liberty Street.

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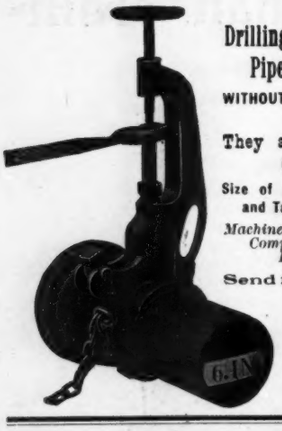

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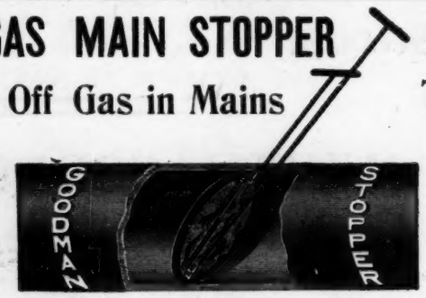

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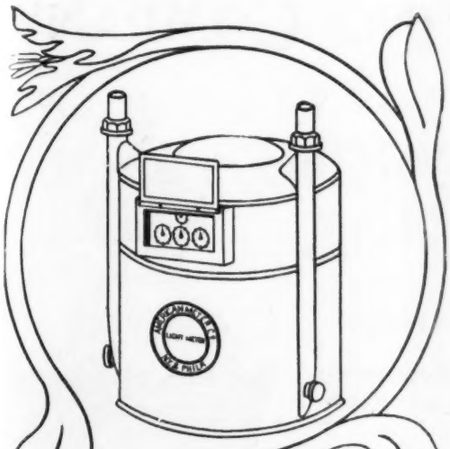

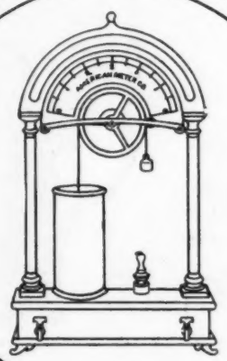

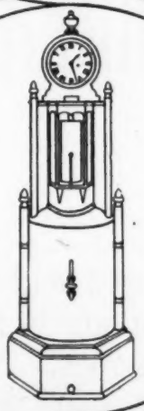

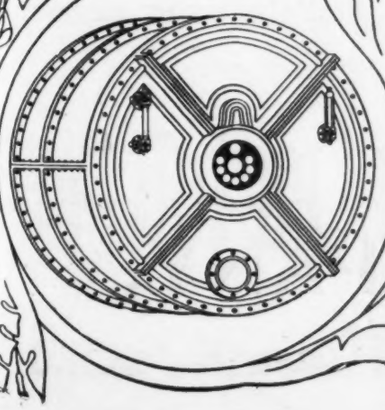

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CHICAGO, ST. LOUIS,

SAN FRANCISCO.

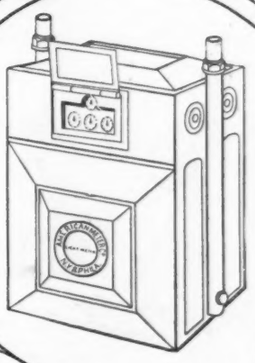
PUBLIC LIGHTING TABLE.

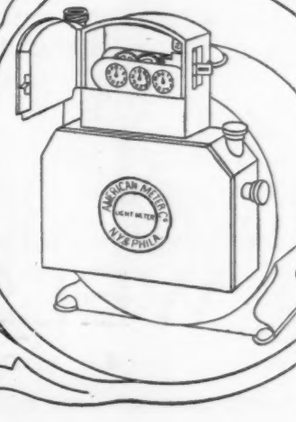
SEPTEMBER, 1902.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Mon.	1	7.00 PM NM	4.30 AM	6.30	4.20
Tue.	2	7.00	4.30	6.30	4.20
Wed.	3	7.00	4.30	6.15	4.30
Thu.	4	7.00	4.30	6.15	4.30
Fri.	5	7.00	4.30	6.15	4.30
Sat.	6	7.50	4.30	6.15	4.30
Sun.	7	8.30	4.40	6.15	4.30
Mon.	8	9.10	4.40	6.15	4.30
Tue.	9	9.50 FQ	4.40	6.15	4.30
Wed.	10	10.40	4.40	6.05	4.40
Thu.	11	11.30	4.40	6.05	4.40
Fri.	12	12.30 AM	4.40	6.05	4.40
Sat.	13	1.30	4.40	6.05	4.40
Sun.	14	2.20	4.40	6.05	4.40
Mon.	15	3.30	4.40	6.05	4.40
Tue.	16	No L.	No L.	6.05	4.40
Wed.	17	No L. FM	No L.	5.55	4.50
Thu.	18	No L.	No L.	5.55	4.50
Fri.	19	6.30 PM	8.10 PM	5.55	4.50
Sat.	20	6.30	8.40	5.55	4.50
Sun.	21	6.20	9.30	5.55	4.50
Mon.	22	6.20	10.20	5.55	4.50
Tue.	23	6.20	11.10	5.55	4.50
Wed.	24	6.20 LQ	12.10 AM	5.40	5.00
Thu.	25	6.20	1.20	5.40	5.00
Fri.	26	6.20	2.20	5.40	5.00
Sat.	27	6.20	3.30	5.40	5.00
Sun.	28	6.10	5.00	5.40	5.00
Mon.	29	6.10	5.00	5.40	5.00
Tue.	30	6.10	5.00	5.40	5.00

TOTAL HOURS LIGHTING DURING 1902.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	238.30	January	423.20
February	196.20	February	355.25
March	196.20	March	355.35
April	166.40	April	298.50
May	151.40	May	264.50
June	131.10	June	234.25
July	142.40	July	243.45
August	162.00	August	280.25
September	179.00	September	321.15
October	216.30	October	374.30
November	224.10	November	401.40
December	250.00	December	433.45
Total, yr.	2255.00	Total, yr.	3987.45





NEW YORK, 33 Nassau Street. PHILADELPHIA, Broad and Arch Streets. CHICAGO, Foot of Orleans Street. BOSTON, 624 Tremont Building.
CLEVELAND, 809 Cuyahoga Building. ST. LOUIS, 712 Roe Building. SAN FRANCISCO, 712 Polk Street.

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Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

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It is { Economical, Attractive, Successful, Up-to-date.

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Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

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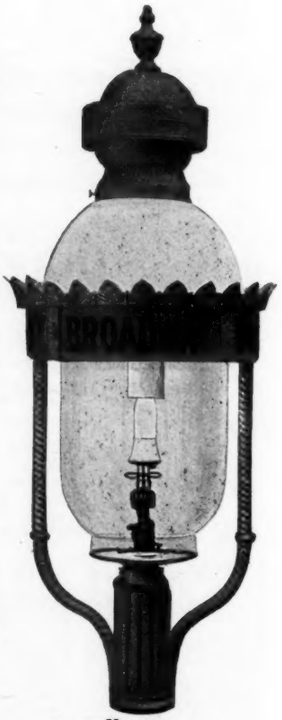

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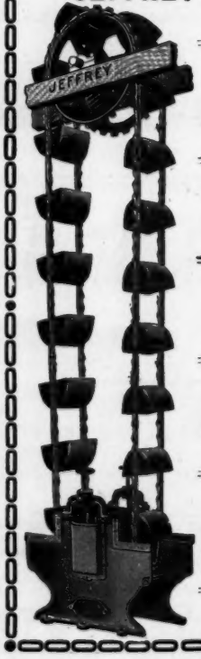

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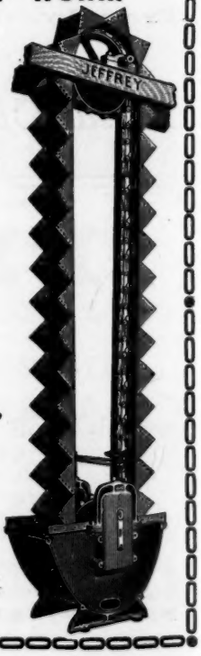

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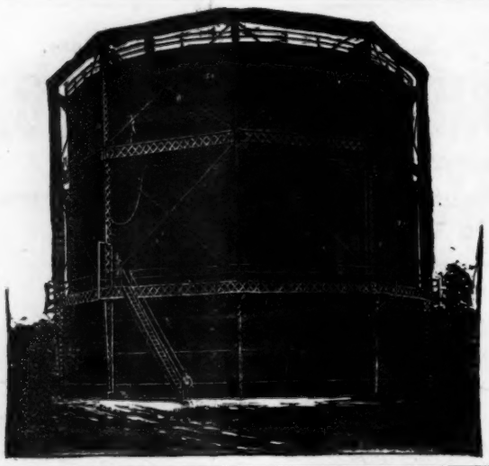

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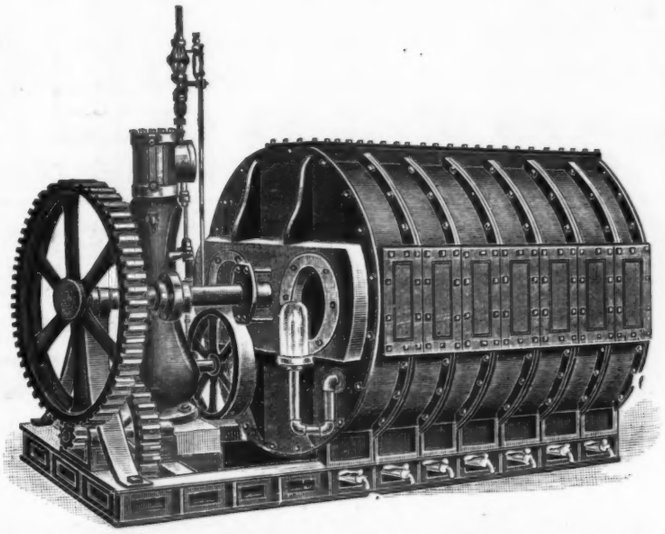

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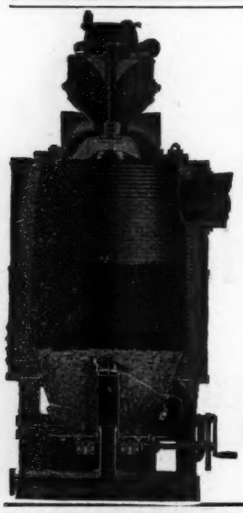

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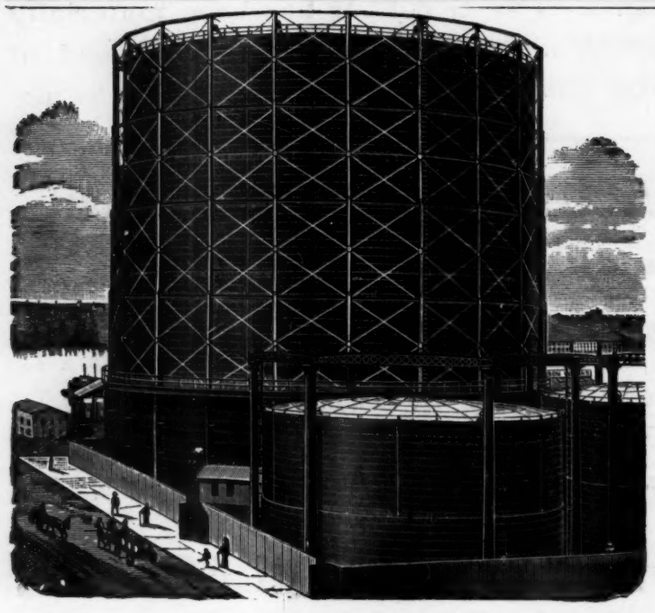

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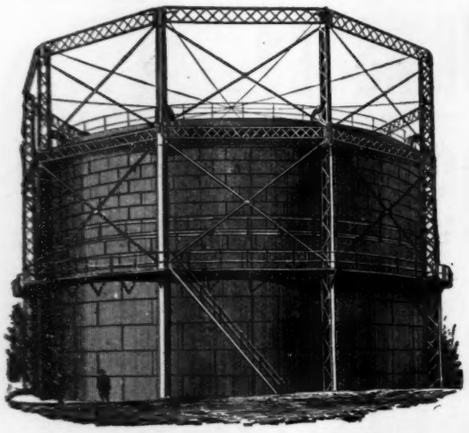

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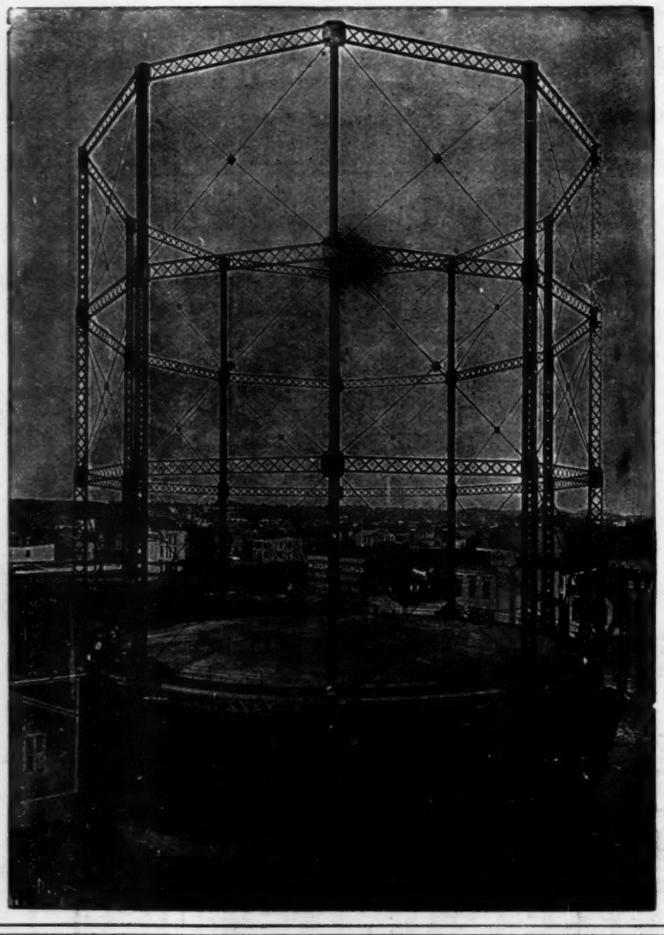

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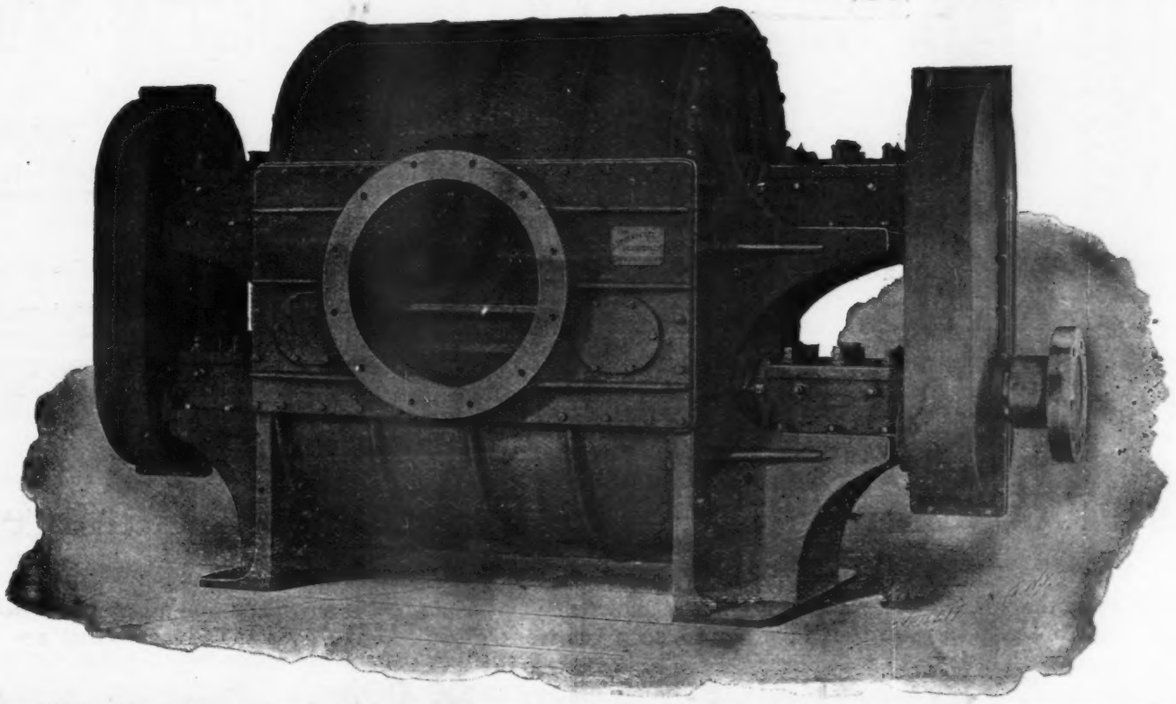

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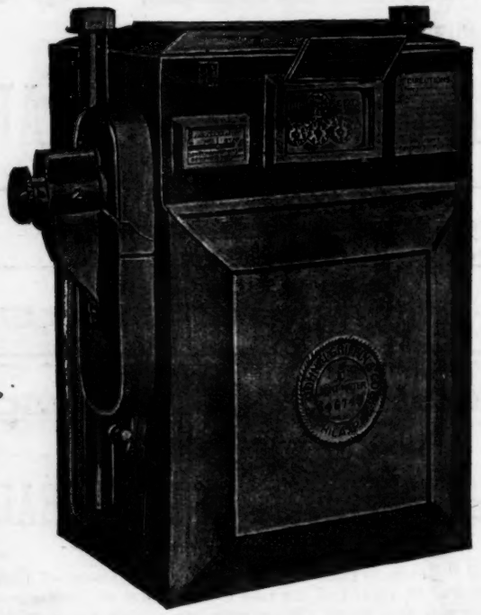

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